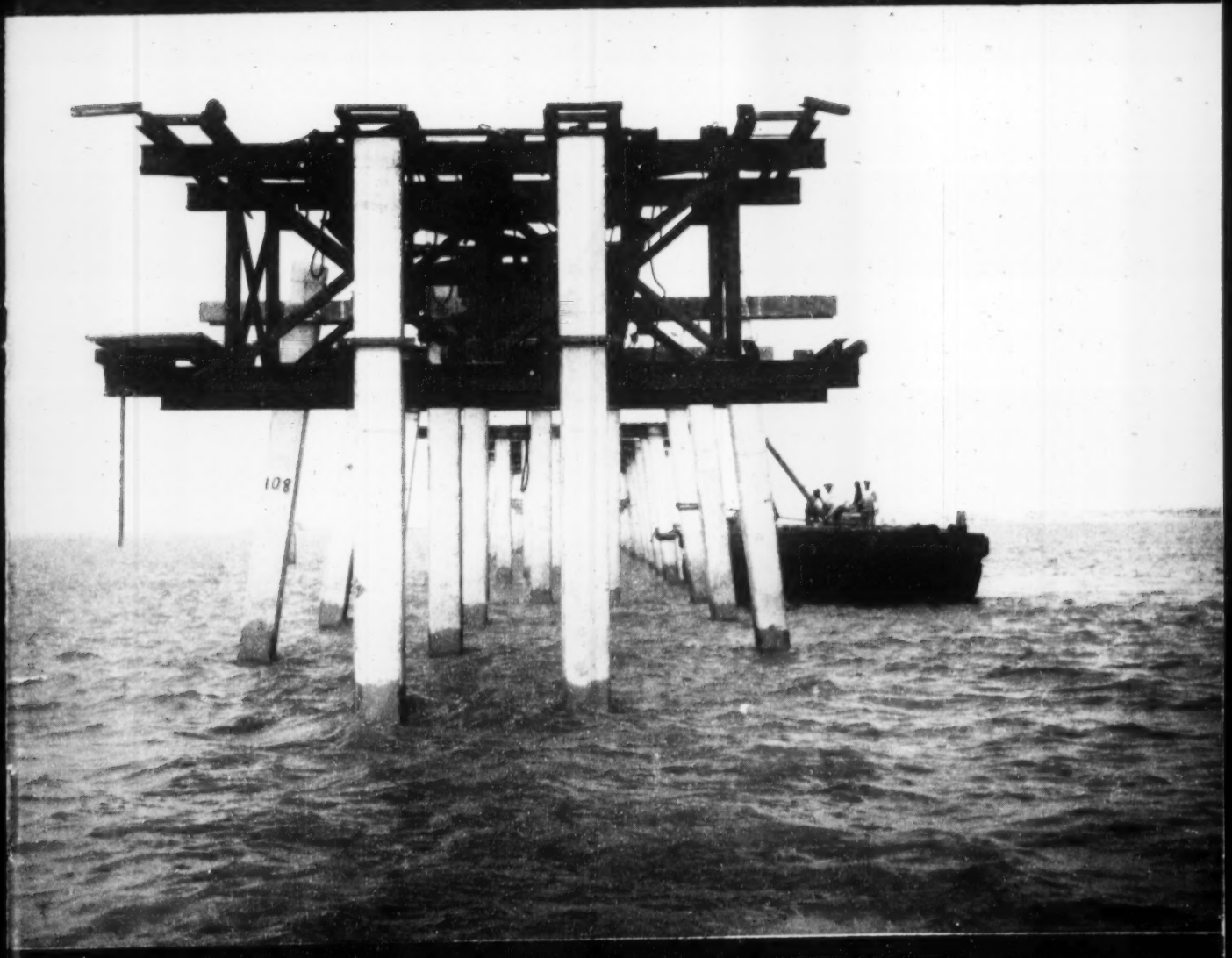
ENGINEERING NEWS-RECORD

EIGHTIETH YEAR OF PUBLICATION



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UNIVERSITY MICROFILMS I
313 N 1ST
ANN ARBOR MICH

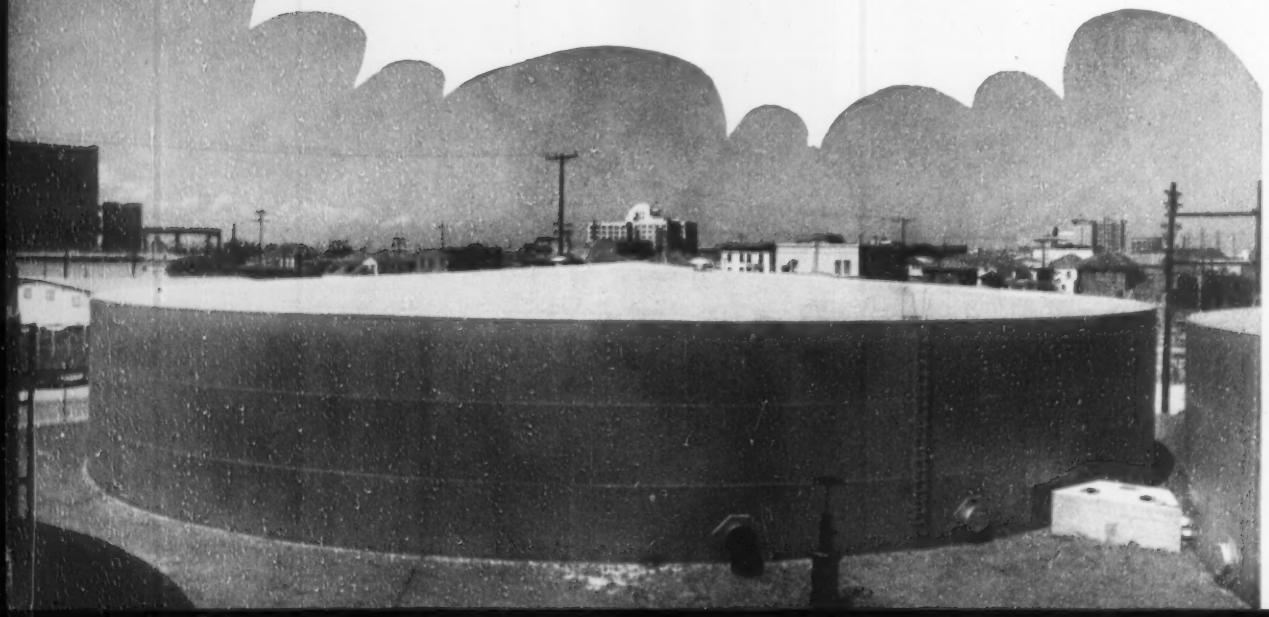
CORRALING 9,674,000 GALLONS OF WATER

Galveston, Texas, has all this water "corraled" in three multi-million gallon Horton® reservoirs to take care of increasing water demands. This reserve assures Galveston water consumers that there will be no temporary water shortages . . . and provides an adequate reserve for future municipal growth.

Perhaps your community is outgrowing its present municipal water system or reserves are too small. Whatever your needs may be, Chicago Bridge & Iron Company has the facilities and engineers to help assuage your "growing pains". Horton standpipes and reservoirs are built in standard capacities up to 10,000,000 gallons and Horton elevated tanks in sizes to 3,000,000 gallons. Write our nearest office today. CB&I engineers will be happy to help you. Be sure to ask for a copy of the new Horton Steel Reservoirs and Standpipes bulletin.

Above: 3,838,000-gal. Horton reservoir at Galveston, Texas.

Below: One of two 2,918,000-gal. Horton reservoirs at Galveston.



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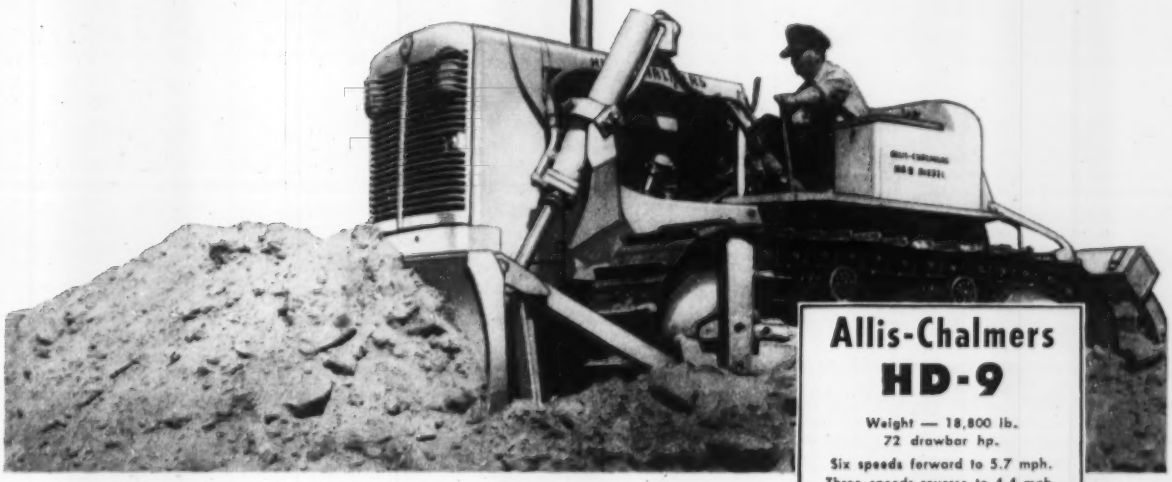
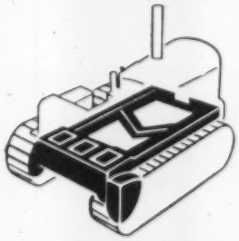
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PA. In Canada: HORTON STEEL WORKS LIMITED, FORT ERIE, ONT.

HERE'S TRACTOR VALUE YOU CAN MEASURE

IN yards PER DAY... IN years OF SERVICE



The Allis-Chalmers HD-9 Tractor offers performance reliability and ease of servicing that pays off in year-after-year efficiency. Here's what we mean:



BUILT TO STAND THE GAFF OF DAILY USE FOR YEARS...

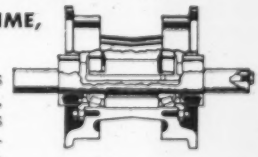
One-piece, welded main frame forms a continuous, strong backbone that means longer life for each tractor.

Oil-enclosed track release mechanism keeps adjustment at required setting and reduces track maintenance and breakage.

Smooth, efficient power train gives extra life, greater ability to absorb the punishment of tough jobs for every gear, shaft and bearing in the tractor.

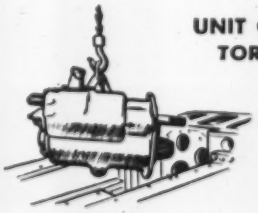
A-type truck frames permit free track oscillation and eliminate twists and strains caused by rough terrain.

EASIER LUBRICATION SAVES TIME, HELPS PROTECT EQUIPMENT



Lubrication period of 1,000 hours for final drives, truck wheels, idlers and support rollers saves both grease and time. Spring-loaded, Positive Seals keep grease in, keep dust and water out.

Fewer, more accessible lubrication points make short work of a chore. No lube points at all under tractor.



UNIT CONSTRUCTION PUTS TRACTORS BACK TO WORK SOONER

Transmission can be removed as a unit without removing clutch, final drive or bevel gear.

Engine can be removed without disassembling clutch.

Truck frame can be dismantled without removing final drive, sprocket or equalizer spring.

Clutch assembly can be removed without disturbing engine or transmission.

Final drive gear and intermediate gear can be removed without disturbing steering clutch.

Each steering clutch can be removed independently without disturbing final drive or bevel gear.

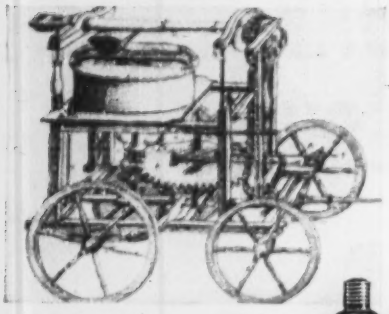
• • •

Let your distributor tell you more about the rugged construction, ease of servicing and outstanding performance ability of the Allis-Chalmers HD-9 Tractor. It's a story that adds up to value you can measure in yards per day and in years of service.

ALLIS-CHALMERS

TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

17th century PENCIL SHARPENER?



Well, whatever it is, complex as it appears, this drawing is not nearly as complex as the engineering drawings of today. The need for drafting precision has increased steadily over the years.

To keep pace with this need, Staedtler has made constant improvement in pencil design and manufacture ever since the first Staedtler pencils were produced in Nurnberg, Germany, in 1662 – about the time the above drawing was made.

Today, the Mars-Lumograph is America's finest imported drawing pencil. In the clutch pencil field, the combination of the new 1001 Mars Technico push-button lead holder and 1904 Mars-Lumograph imported drawing leads insures your having the very best.

The 2886 Mars-Lumograph drawing pencil gives you precise thickness and the blackness of line needed for crisper, cleaner prints. Perfectly graded in 19 degrees—EXEXB to 9H. $1.50 per dozen—less in quantity.

The 1001 Technico Mars-Lumograph push-button lead holder costs no more than ordinary holders, has a noiseless, smooth-working, low-friction clutch mechanism, lightweight wood construction with perfect balance and, built into the push-button cap, a unique lead sharpener. $1.50 each—less in quantity.

1904 Mars-Lumograph Imported Drawing Leads are so opaque that inking-in is not necessary. Leads are ribbbed for firm clutch grip and each has a metal cap which prevents sliding from holder. Available in 18 degrees—EXB to 9H. $1.20 per dozen—less in quantity.

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ENGINEERING NEWS-RECORD

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Robert F. Boger
Publisher

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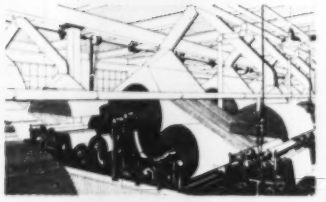
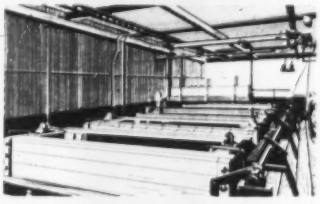
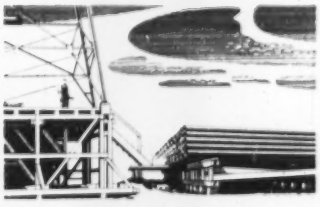
*Wolmanized
LUMBER
stresses application versatility

... among these four outstanding benefits



1 Application versatility. Wolmanized clean pressure-treated lumber is an improvement on nature. Having all the versatility and user acceptance that is traditional of wood, Wolmanized lumber goes even farther. It is many times longer lasting than untreated lumber, while being deadly to rot and termites. Wolmanized lumber is the treated lumber that is "pedigreed" with actual documented Service Records. These records not only authenticate more than a quarter century of service but list literally hundreds of applications. Wherever you may have use for treated lumber, Wolmanized clean pressure-treated lumber will meet, and will probably exceed, your requirements. Application versatility of Wolmanized lumber is heightened by important added benefits, too. Besides being clean, it is also odorless, completely paintable, harmless to skin and clothing, and noncorrosive to metal fittings.



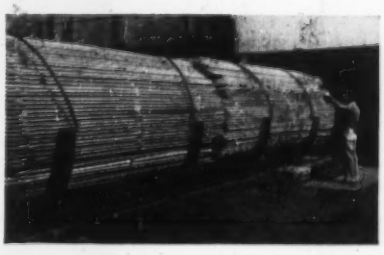


2 Available anywhere. There are many kinds of treated lumber, but 48% of *all* clean pressure-treated lumber is "Wolmanized" brand. This means that nearly as much of it is specified and used as is the combined total of all other kinds. Distribution as well as quality earns such acceptance. 24 qualified wood preserving plants in the United States and Canada provide coast-to-coast distribution, assure certain delivery.

3 Uniform treatment. Wherever you buy Wolmanized clean pressure-treated lumber you can be sure that uniform treatment is providing a product of undeviating high quality. The Wolman brand salts are produced under a single exact formula. High pressure treatment processes by which Wolman preservative, in solution, is driven deep into wood fibers must also meet rigid AL&T requirements.

Only properly equipped, responsible wood preserving organizations can qualify for licenses to produce under the "Wolmanized" brand.

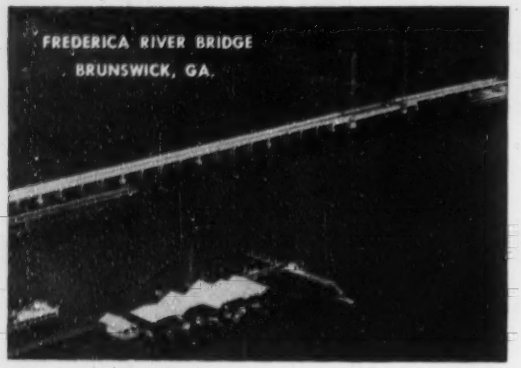
4 Proved dependability. The Service Records that demonstrate Wolmanized lumber's application versatility also prove its dependability. Actual case histories of how Wolmanized lumber has served others, and how it can fill your needs have been compiled into an informative brochure. For full information and your copy of Service Records write: American Lumber & Treating Company, McCormick Building, Chicago, Illinois.



*"Wolman" and "Wolmanized" are registered trade names of American Lumber & Treating Company

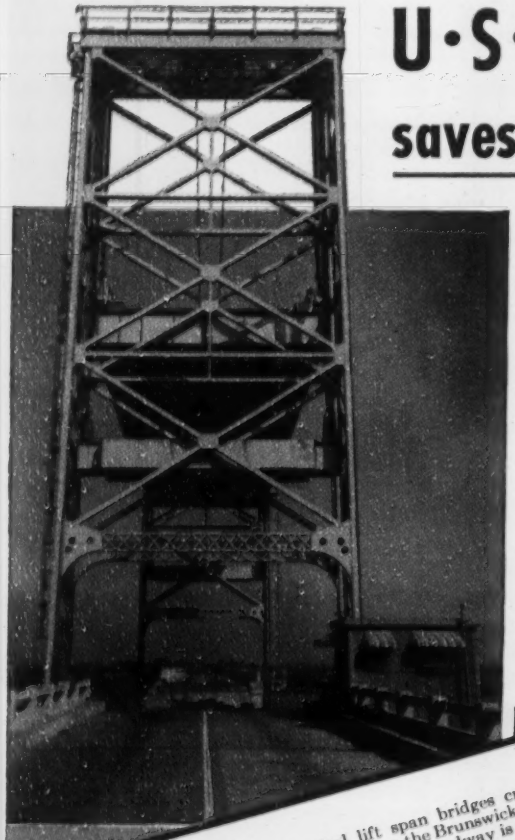
Pressure-Treated

Wolmanized
LUMBER



On these

U·S·S I-BEAM-LOK saves approximately 101,000 lbs.



The Frederica River Bridge and the Back River Bridge shown here are part of the Brunswick-St. Simons Causeway in Georgia. They are identical structures. Their lift spans are plate girders with a clear opening for navigation of 100 feet horizontally and 80 feet vertically in the raised position.

These two bridges provide interesting examples of the use of U·S·S I-Beam-Lok Open Steel Flooring to assure substantial economies by saving weight in the flooring.

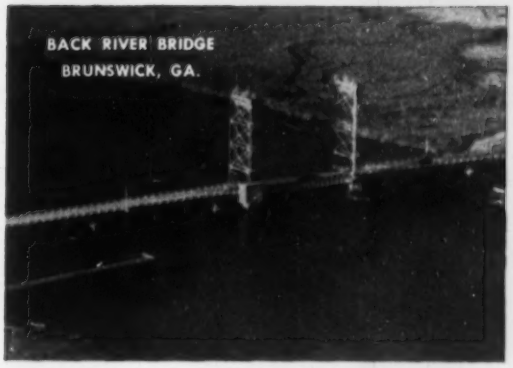
By using 5" open steel flooring, which weighs 18.8 psf. as against about 60 psf. for a conventional 6½" lightweight concrete slab, it was possible to save more than 50 tons in the weight of the floor on each of the bridges.

Photographs show identical lift span bridges crossing the Frederica River and Back River on the Brunswick-St. Simons Causeway, Georgia. On each, the 24' roadway is constructed of approximately 22.5 tons of 5" U·S·S I-Beam-Lok Open Steel Flooring with 2'-wide steel safety curb on each side.

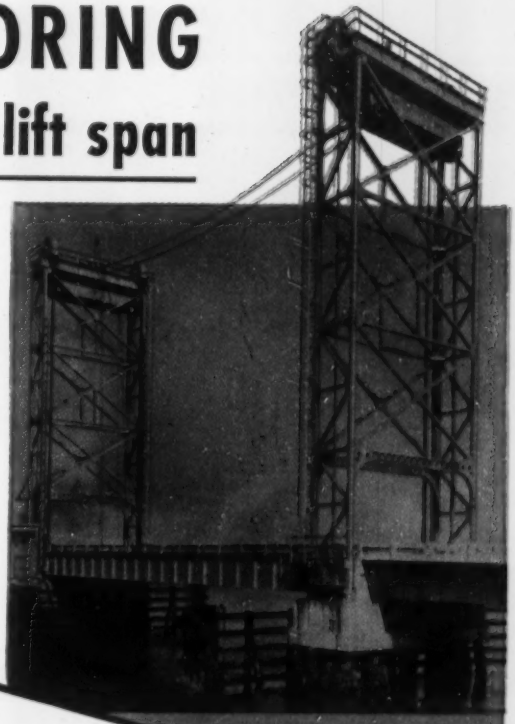
Owner: Brunswick, Ga. and Glynn County
Contractors: Tidewater Construction Corporation
Norfolk, Virginia
Designers: Sverdrup & Parcel, Inc.
Syndicate Trust Bldg.
St. Louis, Missouri

BRIDGES WERE FABRICATED BY THE AMERICAN BRIDGE DIVISION OF UNITED STATES STEEL CORPORATION

2 bridges..



OPEN STEEL FLOORING
deadweight on each long lift span



Its light weight also makes I-Beam-Lok ideally suited for reflooring jobs because in most cases it can be applied directly to existing stringers without requiring secondary supports. I-Beam-Lok can be erected easily and speedily (on reflooring projects, with a minimum interruption of traffic) to produce a smooth riding, skid-resisting, self-cleaning, fireproof and long-wearing surface.

For more information about the time-saving, money-saving advantages of this lightweight steel flooring in bridge construction, contact the sales office nearest you.

UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.
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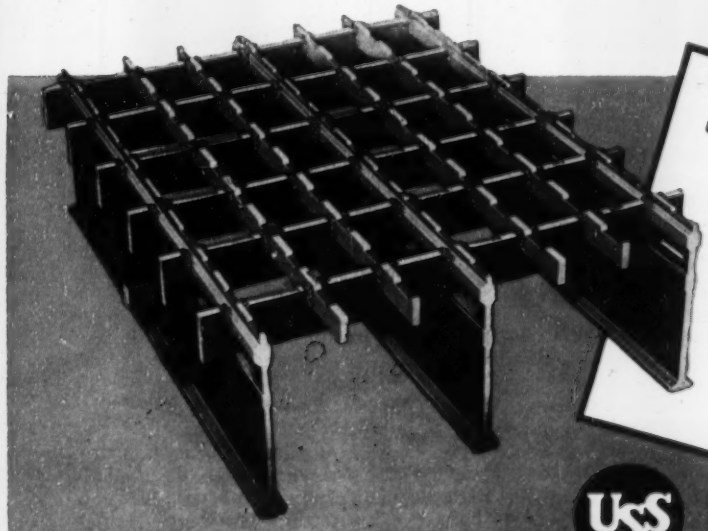
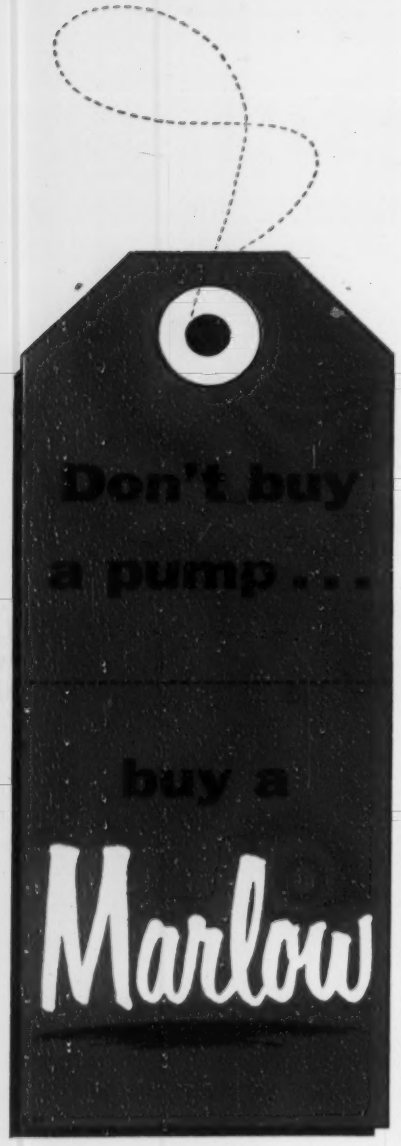


U·S·S I-BEAM-LOK OPEN STEEL FLOORING is available in units measuring 6'-2" in width and up to 49' in length. This lightweight, all-steel flooring with its strong, full 5" depth can be applied directly to stringers on spans up to 4' centers to permit H-20 loadings. It does not require secondary supports. This "modern floor for modern traffic" combines weight saving and reduced costs with roadway rigidity, ease of erection, a smooth, hard, self-cleaning surface and low maintenance costs. It is also available in concrete-filled type.

USS

UNITED STATES STEEL



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READER COMMENT

Better design? Raise fees

SIR: The article by Stephen D. Teetor in ENR March 18, p. 49, on flat-plate construction is most excellent and should be thoroughly studied by every structural engineer.

The section on "Scope of building department" produced an immediate reaction. A fee of ¼ of 1% of the cost of construction is often a large part of the fee that the structural engineer receives for preparing all the plans and making all the calculations. I think we should have a campaign to raise structural engineers' fees.

The greatest two factors in sloppy design and construction are lack of time and insufficient compensation. The time spent by the building department having a set of plans checked would better be spent by the design engineer. On the other hand, I can see the value of the building department having a club to use against architects and engineers, if required.

MILO S. KETCHUM
Ketchum and Konkel
Consulting Engineers
Denver

Good drawings bar trouble

SIR: S. D. Teetor, in an article in ENR March 18, p. 49, has correctly outlined a number of pitfalls in the design and construction of flat-plate and related structures that have caused structural failures in the past. However, in suggesting safeguards for avoiding those pitfalls he has omitted one which is of major importance; namely, adequate and accurate engineering drawings and details.

It is not the design analysis but the structural drawings that convey the needed information to the man in the shop and in the field. No matter how accurate the design analysis might be, or how competent an engineer has been employed to prepare it, if the structural drawings are inadequate, and the details of bending and placing the reinforcing steel insufficient and obscure, there is going to be plenty, and sometimes very serious trouble in the field.

Engineers rely too often on reinforcing steel fabricators to do the detailing. This is a serious pitfall. Shop drawings, instead of being simplified and more detailed reproductions of the engineering drawings for fabrication purposes, become engineering drawings that never are adequately checked.

Mr. Teetor alerts designers to be on guard against shop fabricators who, in order to save tonnage, are cutting corners by "cutting alternate bars short," and who are reducing the effective depth of structural members by placing the reinforcing steel in several layers. It seems that Mr. Teetor is proposing remedies to a situation that basically is not a healthy one. However, instead of the remedy—carefully checking voluminous shop drawings—Mr. Teetor suggests, a better safeguard against failures is to make the engineering drawings more complete and more accurate, with no deviation allowed unless specifically authorized by the design engineer.

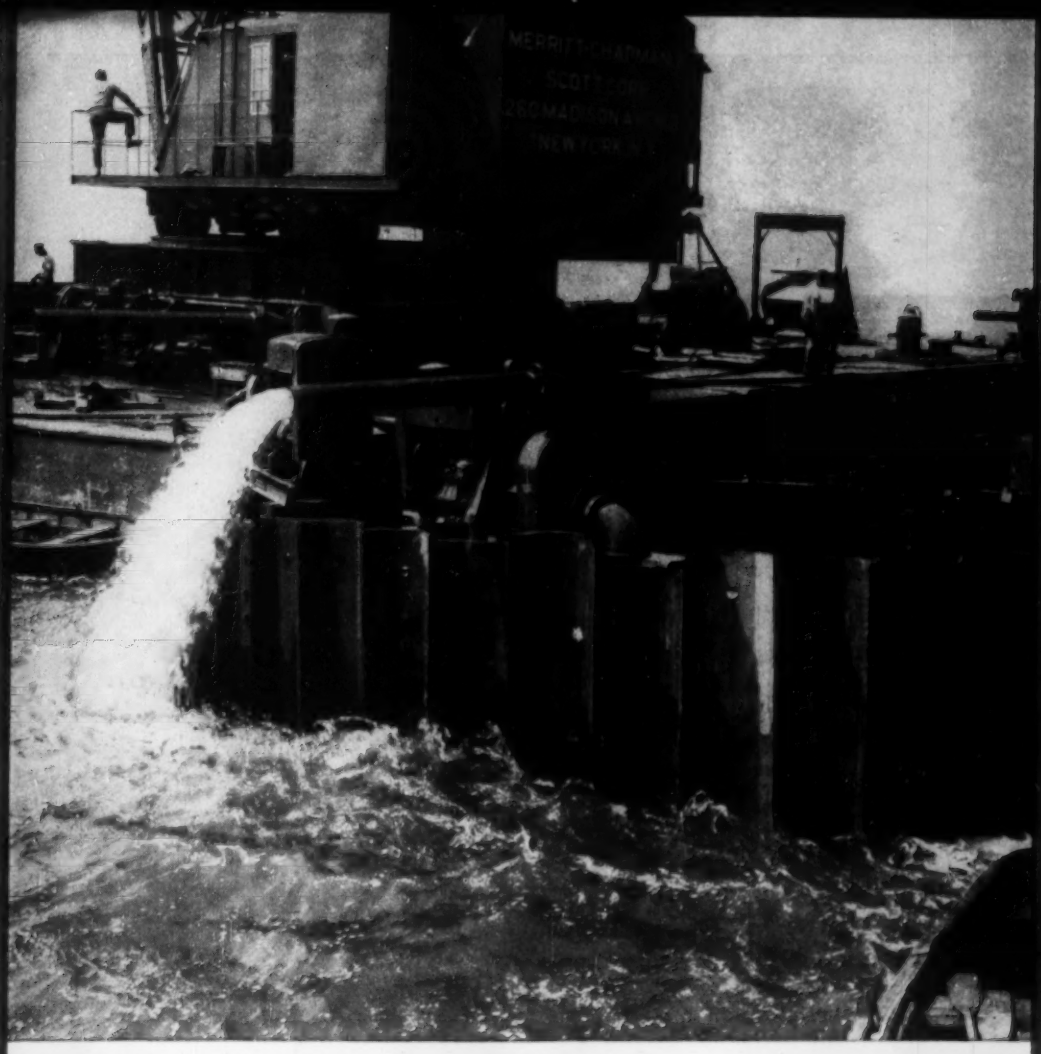
Much reliance cannot be placed on field inspectors to detect major errors and correct serious design mistakes, even when they are competent designers. In most cases, difficulties of design and detailing are not in typical or symmetrical bays, design and detailing of which are amply covered by building codes, but where special and unusual conditions exist, such as around staircases, shafts, equipment openings in floors, etc. It takes not just a designer, but one who is familiar with the special design requirements of the particular building, to detect errors.

An inspector should be qualified and well-trained in his field, not because "the details from which he is working may be inadequate," but to see that the work is done according to the plans and details, which should be very precise and clear, and to bring to the attention of the design engineer any new conditions in the field for additional design and analysis.

While I fully agree with Mr. Teetor that designers should be sent to the field, I don't agree with his motive—to make good inspectors out of them. The object should be to make better designers out of them. Field experience helps develop in designers a sense of reality and a more practical approach to the problems they have to solve in the office.

The Fluor Corporation is now completing construction of a three-story office building at the site of its main plant, where floors and roof are of flat-plate design. The building was designed by Fluor's Industrial and Governmental Projects Division. I have made a number of inspection trips during construction, to this building in particular, and to many others, and after every trip I always come back to the office with the same conclusion: As far as design is concerned, there is no substitute for adequately drawn and clearly detailed engineering draw-

(Continued on page 10)



PIERS FOR THE THREE MILE BRIDGE over the Hudson River on the New York State Thruway between Nyack and Tarrytown created no problem for Merritt-Chapman & Scott Corporation of New York City. Of a total of 23 piers, 15 were built with cofferdams, two for each pier. Dependable, 8" AGC rated Marlow Self-Priming Centrifugal Contractor's Pumps were used on the job to dewater the cofferdams quickly and handle seepage water efficiently.

marlows are dependable!

Construction bids must be *right* to get the job and make a profit! Progressive operators use new methods and modern equipment to reduce costs. When it comes to pumping jobs, more and more contractors know they can depend on rugged, efficient Marlow Self-Priming Pumps or famous Marlow "Mud Hogs" to get the job done *on time* with little attention and low maintenance. See your Marlow dealer or write for Bulletin C-52.

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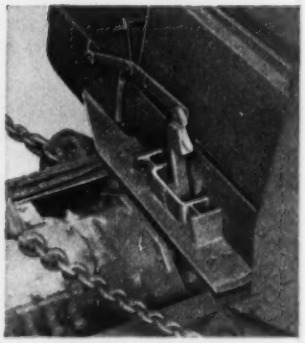
GRAVITY DUMP



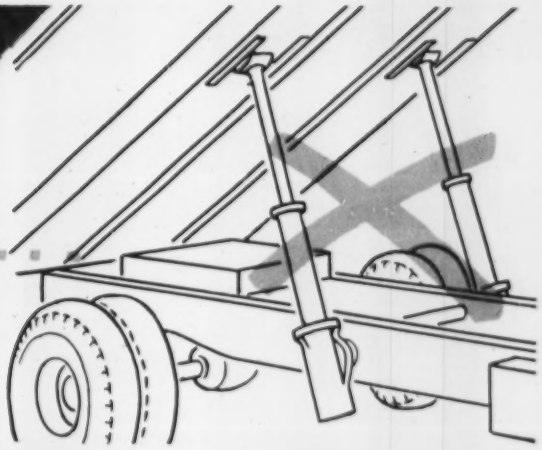
SIMPLE BODY RELEASE LEVER WORKS *INSTANTLY*

1 Body release lever is located in cab to left of steering wheel. Lever engages toggle linkage to latch hook on chassis . . .

2 Trip rod instantly releases latch hook from body latch seat on the tilting Dumptor body. Gravity dumps load instantly as . . .

3 Body rolls on heavy-duty rockers. Snub chains attached to big coil spring shock absorbers check body at 70-degree tilt.

eliminates body hoists. . . .



Koehring Dumptors®

have no slow-working body hoists. Operator trips the body-release lever . . . and gravity dumps the 6-yard load in just one second. It's as simple as that!

Saves 20 seconds every time you dump Because there is no waiting for slow-raising body hoists, one-second dumping saves 15 to 25 seconds dump-time on every cycle. This gives you more productive haul-time . . . earns an important increase in extra yards per hour.

Never balks . . . never wears out . . . There are no expensive hoist replacement parts, hoist maintenance or down time to eat into your profits. Koehring gravity dump is always instantaneous, trouble-free in all temperature extremes . . . never balks . . . never wears out.

No spring maintenance is another money-saving Dumptor advantage. There's just one big, double-coil chassis spring on steering axle, none on driving axle. Big shock-absorbing drive tires eliminate need for more springs . . . save spring maintenance time and replacement costs.

Check your body hoist and spring maintenance costs for a year. See how much you'll save when you haul with Koehring heavy-duty Dumptors. Get all the facts from your Koehring distributor soon . . . or write us for 28-page Dumptor catalog.

KOEHRING COMPANY

MILWAUKEE 16, WISCONSIN

KOEHRING HEAVY DUTY

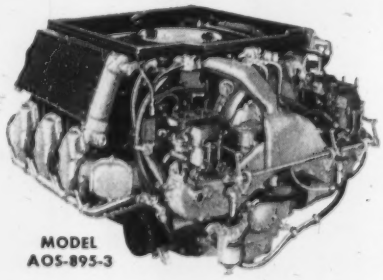
Subsidiaries: PARSONS KWIK-MIX · JOHNSON

K341

MORE POWER for the TOUGH JOBS

More power, and *better* power—that's what you get when you buy a truck with Continental Red Seal under the hood. *Better* because the engine delivers more power in relation to its weight, which means higher payload capacity. Better, too, because the output is delivered at engine speeds conducive to fast over-the-road travel with a minimum of shifting. For the really tough jobs, choose a truck with a power plant that's *built* for the tough jobs and backed by engine experience dating from 1902.

The outstanding series of air-cooled tank and military vehicle engines developed jointly by Army Ordnance and Continental, and thoroughly combat-proved in Korea and elsewhere, are now available commercially, too. They include models developing 375, 500, 810 and 1,040 horsepower, thus greatly extending the range of the Continental line. For information on this and other models in this series, address Continental Motors Corp., Military Divn., 76 N. Getty St., Muskegon, Michigan.



MODEL AOS-895-3

PARTS AND SERVICE COAST TO COAST

1819 BROADWAY, NEW YORK 23, NEW YORK • 3817 S. SANTA FE AVE., LOS ANGELES 58, CALIF.
6218 CEDAR SPRINGS ROAD, DALLAS 9, TEXAS • 910 S. BOSTON ST., ROOM 1008, TULSA, OKLA.
1252 OAKLEIGH DRIVE, EAST POINT (ATLANTA) GA.

Continental Motors Corporation
MUSKEGON, MICHIGAN

READER COMMENT

ings as a safeguard against serious trouble in the field.

ZORAH E. SHEFFNER
The Fluor Corporation, Ltd.
Los Angeles, Calif.

City, not state, built bridge

SIR: I have read with interest your article, "Experience with bridge prestressing methods," appearing in the March 18 issue of ENR.

However, I was disappointed to note in the brief mention of the prestressed bridge constructed over the Platte River at Mississippi Ave. here in Denver that the Colorado Highway Department was given credit for its construction. Actually, the bridge was constructed with city of Denver money, and its inception, design and construction were handled entirely by the city engineering department.

We have been rather proud of being the pioneer of prestressed bridge construction in the entire Rocky Mountain area. The bridge has served as an engineering laboratory for the various state highway departments, federal agencies and other interested organizations in this area.

D. S. WRIGHT
City Engineer
Denver, Colo.

To keep the record straight

SIR: Congratulations on your March 18th story, "Experience with Bridge Prestressing Methods." It is the most comprehensive treatment of prestressed concrete construction problems yet undertaken by any publication and should go a long way towards answering many questions in the minds of contractors and bridge engineers.

We would like to call to your attention a typographical error which appeared in the table at the bottom of Page 39. The number of tendons required for each prestressed concrete beam using the Lee-McCall system was 6 rather than "16" as printed.

E. SCHECHTER
Vice President
Stressteel Corp.
Wilkes-Barre, Pa.

Still an "elevated"

SIR: I read with interest the news report on monorail rapid transit for Los Angeles in ENR March 18, p. 55.

The primary purpose of the use of any such structure (excluding rare cases, such as one in Germany) is to get the trains up above the street or

(*Continued on page 12*)

If FASTER COMPLETION cuts costs...

For huge industrial projects like this, or for the smallest of jobs, Monotube piles meet every engineering requirement while saving time and dollars.

Monotube Foundation Piles

look how MONOTUBE PILES can help!

1. LIGHT WEIGHT. Much faster driving due to reduced inertia. No need for a core or mandrel. More piles driven per rig per shift!

2. SIMPLIFIED PROCEDURE. Light standard cranes suffice. They move in quickly. Setup and moving time is cut. Over-all time and costs are reduced.

3. EXTENDIBILITY. Quickly, easily weld-spliced to *any* length, on the spot, using standard extensions or cutoffs. Because of light weight, high strength and easy handling, field welding goes *fast.* No difficult welding operations.

Here are just a few of the cost-important reasons why more and more jobs are getting off to a good start with Monotube piles. Get *all* the facts. Write to The Union Metal Manufacturing Co., Canton 5, Ohio, for Catalog No. 81.

UNION METAL

Power that pays off!

that's Le Roi heavy-duty power

Built by a manufacturer who concentrates exclusively on the problems of the heavy-duty field

POWER you can punish. Power you don't have to pamper. Power that pays off in dependable service — in operating economy — in quick field maintenance. That's Le Roi power!

A Le Roi is no automotive lightweight — it's a power-packed, valve-in-head engine designed especially for heavy-duty service. You get the advantages of weight and stamina that stand the abuse handed out to field equipment, without costly breakdowns. And you get many features that add to the dependability and economy of operation — features that have been proved wherever tough conditions test soundness of design and quality of materials and workmanship.

A typical Le Roi engine application in the farm-equipment field — powering a Papec Forage Harvester. Le Roi power is first choice of many manufacturers of oilfield, construction, industrial and agricultural equipment.

Yes, sir, Le Roi is your best power buy—whether you're getting new equipment or replacement engines, or whether you're looking for an efficient power plant for the equipment you've designed. Le Roi has a full range of sizes from 15 to 635 hp — for gasoline, natural gas, butane.

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LE ROI COMPANY

A Subsidiary of Westinghouse Air Brake Co. E-91

MILWAUKEE 14, WISCONSIN

Plants: Milwaukee • Cleveland — Greenwich — Dunkirk, Ohio • Coldwater, Michigan

READER COMMENT

other land use on the ground. When the supporting beams are above the trains, then the structure is necessarily high enough to accommodate the desired underclearance plus the height of the cars plus any space needed by the car truck frames.

If the beams are under the cars, then the height of the structure must accommodate the desired underclearance, plus the space needed for beams, themselves, which probably will not differ greatly from the space needed for beams in the case of the suspended train. If any difference is observed, the beams for support under the train will be shallower since two lines of beams instead of one can be used.

In the case of the suspended train, the forces from the train, including centrifugal and wind forces are applied several feet higher than is the case when the beams are under the cars.

Of course, when the beams are placed under the cars, then an "elevated" is built; and "elevated" is a word with symbolic meaning. I cannot but believe, however, that the public money spent on a monorail would be better spent finding a new name for a railroad line supported on structure.

JOHN G. KNEILING
Engineering Consultant
Staten Island, N. Y.

On engineer unionization

SIR: The articles in your magazine on a union of engineers (ENR Mar. 18, p. 21) interest me because they miss the point to some extent. The engineers they talk about are not flesh and blood engineers who have a home to pay for and a family to raise.

The engineer I am talking about is carried on the payroll as a draftsman or instrument man. He is hired and fired with the duration of the job, the same as any other building tradesman.

There is a difference. Common building laborers in the Cleveland area are paid $2.48 per hour; iron workers $3.12½ per hour. The engineer is paid between $2.00 and $2.50 per hour. The laborer gets double time for overtime over eight hours. The engineer gets time and one half for over 40 hours per week, and in some cases the employer limits his activities to the state lines and avoids extra overtime pay.

Building mechanics are appalled when they learn that the men planning and laying out their work, are paid less than common laborers.

History shows that unions are a result, not a cause. They come into

(*Continued on page 14*)

Here's Big News!

FORD'S LATEST "172" CU. IN. ENGINE

★ OVERHEAD-VALVE
★ LARGE BORE
★ SHORT-STROKE
★ DEEP RIGID BLOCK

Pictured here are two types of sheet metal available with this Ford "172" 4-Cyl. Power Unit. Either type can also be specified with the Ford "134" 4-Cyl. Power Unit.

Ford
INDUSTRIAL ENGINES
AND POWER UNITS

Here is another Ford power plant of the most modern large bore, short-stroke, low-friction design . . . engineered, built and tested *exclusively* for *industrial* applications!

This new Ford engine delivers the mightiest concentration of power *per cubic inch* of any engine of comparable size and weight. With only 172 cu. in. displacement, this 4-cylinder engine attains a maximum of 58 brake horsepower at 2400 rpm. Less displacement normally requires less gas which means greater daily operating economy. Other outstanding features of this new Ford "172" Heavy Duty Industrial Engine are listed below.

Glance through them now and don't hesitate to ask or write for a detailed folder with complete specifications or any other information on the latest in engine design. *Write to:*

INDUSTRIAL ENGINE DEPARTMENT
FORD MOTOR COMPANY
15050 Woodward Avenue, Highland Park 3, Michigan

Features that Provide Highest Performance and Outstanding Economy

Large bore (3.90 in.) combined with *short stroke* (3.60) cuts piston travel, reduces friction, delivers more power at clutch and reduces fuel costs.

Deep-skirted crankcase is a feature that provides high structural rigidity for more efficient operation and longer life.

Precision-molded alloy iron crankshaft, fully counter-balanced in motion with mirror-like bearing surfaces that reduce friction to a minimum.

Free-turn valves (intake and exhaust) for even wear to help maintain high compression for longer than average period and reduce the possibility of valve sticking.

Weather-proofed ignition provides molded rubber integral seals for all spark plug terminals and lead wires. Distributor also tightly sealed against dust and dampness.

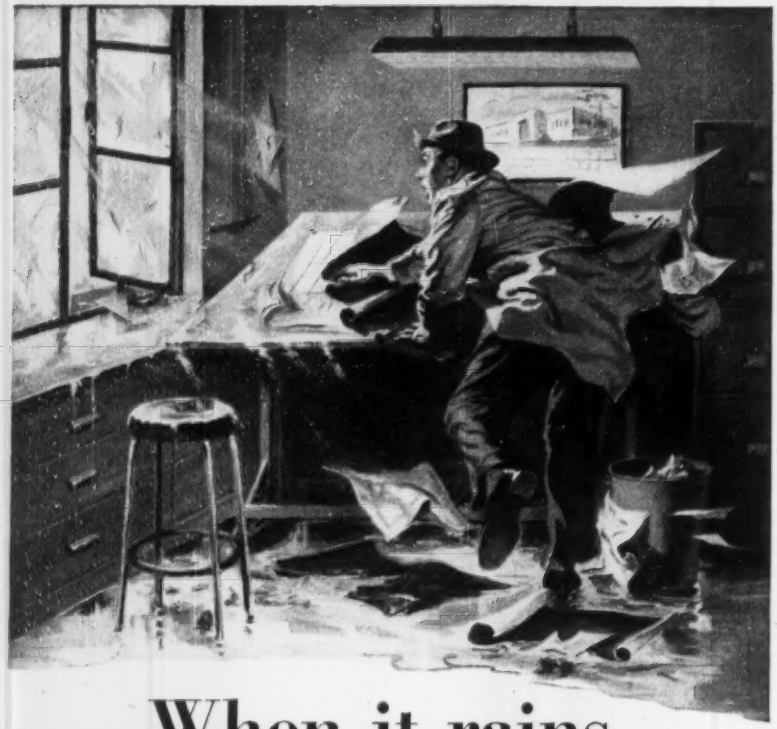
Full-flow oil filter with full-pressure lubrication contributes to longer engine life.

Autothermic pistons of cam-ground aluminum alloy with steel struts for controlled piston-to-sleeve clearance.

Full-length water jackets surrounding each cylinder to maintain uniform temperature, which in turn minimizes bore distortion and reduces wear.

Fast-acting, fully lubricated, variable speed governor is mounted on crankshaft as an integral part of engine.

Every Ford Industrial Engine from 134 cu. in. to 317 cu. in. is a complete, precision-built "Power Package," delivered fully equipped, tested and ready-to-run. All are available as Engine Assemblies or Complete Power Units with a wide variety of accessories and adaptations to fit your job.



When it rains,
it sometimes pours destruction

(A true story based on Company File #118B6275)

We're architects — and when we locked our trim little office one evening we never expected it to look so different the next morning.

What a mess it was after that sudden thunderstorm! Broken windows. Water everywhere . . . on the floor . . . on the cabinets. Worst of all, on our drafting table.

We'd been working on a bank job, and were almost finished. Now every tracing was ruined! The cost of making new ones would have come out of our own pocket if we hadn't carried Valuable Papers Insurance. Our policy paid us back every cent it cost us to re-do the tracings.

Are you sure *your* drawings, blueprints, notes, books, maps or other valuable papers are completely safe from disaster?

Not only storm. But fire. Water. Even earthquake . . . explosion . . . riot . . . building collapse . . . damage by burglars, or sheer vandalism.

Nobody in the construction business should take this chance. Protect yourself against financial loss (even loss which occurs off your own premises) with adequate Valuable Papers Insurance.

Ask your Hartford Accident and Indemnity Company Agent or your insurance broker to give you full details about this essential, low-cost protection. You'll never regret it.

Year in and year out you'll do well with the

Hartford

Hartford Fire Insurance Company • Hartford Accident and Indemnity Company
Hartford Live Stock Insurance Company • *Hartford 15, Connecticut*

READER COMMENT

being when the employer refuses to recognize the rights or ignores the welfare of his men. Shortsightedness is responsible for all unions. The issue is clear. It is money. We have been underpaid, understanding and patient. Engineers do not want a union, but a need for a union has been created.

JOHN M. CROWLEY
Cleveland, Ohio

Mixer name misspelled

SIR: In the brief account of an address by Prof. Gustav Magnel, of Belgium, before the Concrete Industry Board of New York City, you refer to a concrete mixer as an "Irish" type (ENR Feb. 25, p. 23). The correct name is "Eirich."

This mixer is made in Germany, not Eire, or northern Ireland. We are the distributors for the Americas.

ALBERT E. MARTIN
Almar Specialty Machines Ltd.
Toronto, Canada

CALENDAR

Concrete Reinforcing Steel Institute, Boca Raton Hotel, Boca Raton, Fla., May 3-8.

Annual meeting, Steel Joist Institute, Boca Raton Club, Boca Raton, Fla., May 4.

Highway Transportation Congress, Hotel Mayflower, Washington, D. C., May 4-6.

American Welding Society, national technical meeting, Hotel Statler, Buffalo, N. Y., May 5-7.

N. Y. State Society of Professional Engineers, Engineering Industries Exposition, Hotel Commodore, N. Y. City, May 6-8.

Annual meeting, Building Officials Conference of America, Inc., Bellevue-Stratford Hotel, Philadelphia, Pa., May 10-13.

Engineering Institute of Canada, annual meeting, Quebec, May 12-14.

ASCE Structural Conference, Continental Hotel, Kansas City, Mo., May 13-14.

National Fire Protection Assn., Hotel Statler, Washington, D. C., May 17-21.

American Water Works Assn., annual conference, Seattle, Wash., May 23-28.

California Society of Professional Engineers, convention and trade show, Hotel Mark Hopkins, San Francisco, May 27-29.

Column Research Council, Engineering Societies Building, New York, May 27, 28.

National Society of Professional Engineers, Schroeder Hotel, Milwaukee, Wis., June 9-12.

American Society for Engineering Education, University of Illinois, Urbana, June 14-18.

American Society of Civil Engineers convention, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J., June 14-19.

American Institute of Architects convention, Statler Hotel, Boston, Mass., June 15-19.

Conference on Thin Concrete Shells, Massachusetts Institute of Technology, Cambridge, Mass., June 21-23.

strength . . .
Processing the steel end ring of Armored Joint concrete pipe is a show in itself. The sheet steel is curved, welded, shaped, cleaned, iodized and completed expertly and economically, so Universal Concrete Pipe Company can produce a strong pipe with no peer.
Ask us about Armored Joints — something new . . . and for you.
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A subsidiary of American-Marietta Co.

JENKINS PRACTICAL PIPING LAYOUTS 72

Diagram by Huxley Madeheim, Consulting Engineer
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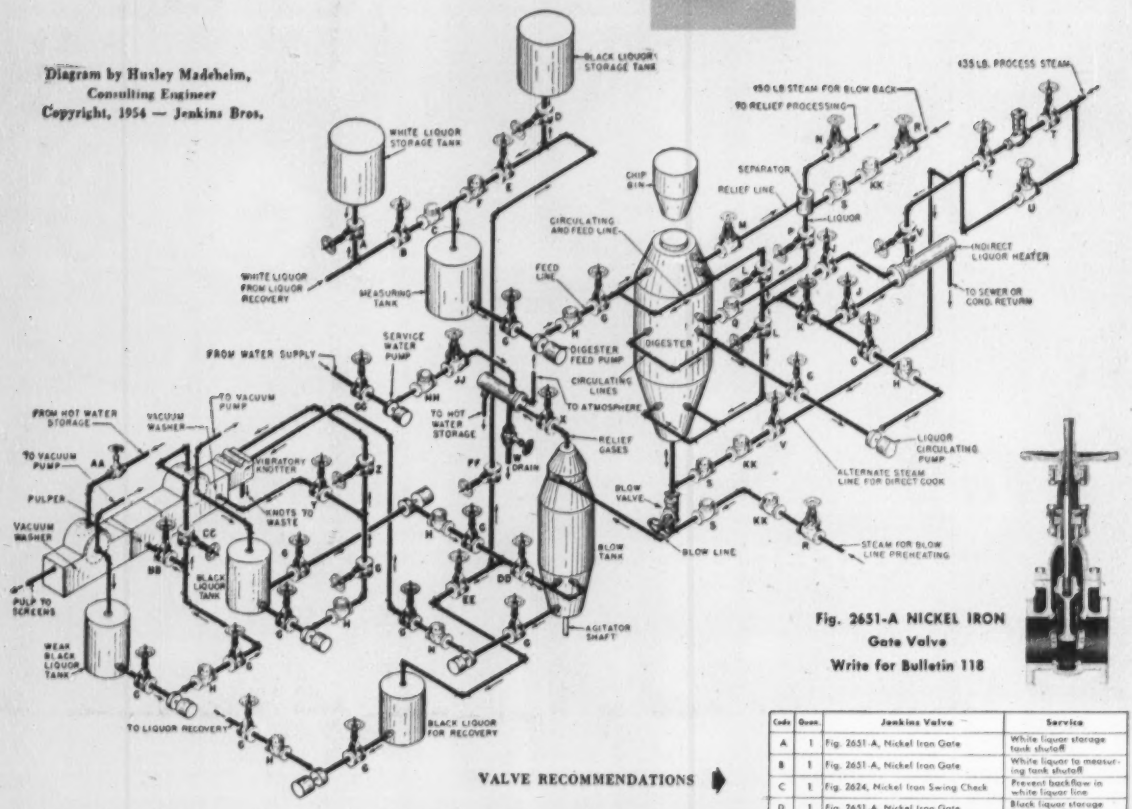

Fig. 2651-A NICKEL IRON Gate Valve
Write for Bulletin 118

VALVE RECOMMENDATIONS

Code	Quan.	Jenkins Valve	Service
A	1	Fig. 2651-A, Nickel Iron Gate	White liquor storage tank shutoff
B	1	Fig. 2651-A, Nickel Iron Gate	White liquor to measuring tank shutoff
C	1	Fig. 2624, Nickel Iron Swing Check	Prevent backflow in white liquor line
D	1	Fig. 2651-A, Nickel Iron Gate	Black liquor storage tank shutoff
E	1	Fig. 2651-A, Nickel Iron Gate	Shutoff black liquor to measuring tank
F	1	Fig. 2624, Nickel Iron Swing Check	Prevent backflow in black liquor line
G	14	Fig. 2651-A, Nickel Iron Gate	Liquor Pump shutoff
H	7	Fig. 2624, Nickel Iron Swing Check	Prevent backflow through pump
J	2	Fig. 2651-A, Nickel Iron Gate	Liquor heater shutoff
K	1	Fig. 2651-A, Nickel Iron Gate	Liquor heater bypass
L	2	Fig. 2651-A, Nickel Iron Gate	Liquor circulating line shutoff
M	1	Fig. 1317, Stainless Steel Globe	Digester relief control
N	1	Fig. 1317-A, Stainless Steel Globe	Control flow of relief gas
P	1	Fig. 2651-A, Nickel Iron Gate	Shutoff liquor from separator
Q	1	Fig. 1331, Stainless Steel Swing Check	Prevent backflow to separator
R	2	Fig. 1040, Cast Steel Globe	Control steam flow
S	3	Fig. 1331, Stainless Steel Swing Check	Prevent liquor flow to steam line
T	2	Fig. 1009, Cast Steel Gate	Control valve shutoff
U	1	Fig. 1040, Cast Steel Globe	Control bypass steam
V	2	Fig. 1009, Cast Steel Gate	Steam shutoff
W	1	Fig. 106-A, Bronze Globe	Drain line control
X	1	Fig. 1307-A, Stainless Steel Gate	Blow tank vent shutoff
Y	1	Fig. 2651-A, Nickel Iron Gate	Black liquor shutoff to washer pan
Z	1	Fig. 2651-A, Nickel Iron Gate	Black liquor shutoff to knotter
AA	1	Fig. 106-A, Bronze Globe	Control water to wash spray
BB	1	Fig. 2651-A, Nickel Iron Gate	Black liquor shutoff to pulper
CC	1	Fig. 2651-A, Nickel Iron Gate	Black liquor shutoff to wash spray
DD	1	Fig. 2651-A, Nickel Iron Gate	Black liquor shutoff to blow tank
EE	1	Fig. 2651-A, Nickel Iron Gate	Black liquor shutoff to recovery
FF	1	Fig. 2651-A, Nickel Iron Gate	Black liquor shutoff to storage
GG	1	Fig. 651-A, I.B.B.M. Gate	Service water pump shutoff
HH	1	Fig. 624, I.B.B.M. Swing Check	Prevent backflow through pump
JJ	1	Fig. 613, I.B.B.M. Globe	Control water supply
KK	3	Fig. 1025, Cast Steel Swing Check	Steam line check

How to plan a SULPHATE PULPING PROCESS SYSTEM

Chemical treatment begins when chips, conveyed to the digester, are cooked in an alkaline solution of sodium sulphide and caustic soda. The residual spent solution (black liquor) is used in subsequent processing, or is restored to its original state in a chemical recovery cycle. The resultant economy is an important advantage of the sulphate process.

The digester fluid is prepared by combining the alkaline solution, either new or recovered (white liquor), with black liquor from the digester discharge, in a predetermined ratio. This blended liquor is pumped into the digester simultaneously with the chips. A liquor circulating pump thoroughly agitates the mixture, and liquor drawn from the center of the digester bypasses the indirect liquor heater and is returned to the bottom of the digester. When the charge is completed, the digester is closed, and the cooking begins.

An indirect heater is used for cooking in sulphate pulping, generally, to prevent excessive dilution of the liquor. This layout also shows an alternate steam line for direct cooking.

When the cooked mixture is ready for removal, the blow valve is opened and the charge is transferred to the blow tank where it is washed and cooled.

In a series of vacuum washers, the pulp is forced onto revolving drums. As the drum revolves, the pulp is washed by sprays. From the last washer, it goes to the paper making process.

Black liquor collected from the first washer is stored for re-use in the digester, pumped to the blow tank for washing the pulp, or pumped to the recovery cycle for conversion to white liquor. This recovery process will be described in a later Jenkins Layout.

Jenkins Nickel Iron Gates and Checks with Stainless Steel Trim are recommended in this system, for valves in contact with black or white liquor.

Consultation with accredited piping engineers and contractors is recommended when planning any major piping installation.

To simplify planning, select all the valves you need from the complete Jenkins line. It's your best assurance of *lowest cost in the long run*. Jenkins Bros., 100 Park Ave., New York 17. Sold through leading Industrial Distributors everywhere.

Complete description and enlarged diagram of this layout free on request. Includes additional detailed information. Ask for Piping Layout No. 72.

JENKINS VALVES
LOOK FOR THE DIAMOND MARK
JENKINS
Jenkins Bros.

Vol. 152, No. 17

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THE CONSTRUCTION WEEK

RUBBER ROAD BOUNCES—There's still some life in those plans for a "rubber railroad"—a conveyor belt stretching from near Pittsburgh to Lake Erie to carry coal north and iron ore south—despite a number of bad bounces.

Akron rubber and Youngstown steel interests—backers of Riverlake Belt Conveyor Lines, Inc.—said they were now getting set for a showdown battle in the Ohio legislature, at its next session. Opposed by railroad and river transport interests, Riverlake wants legislation to permit it to condemn land for right-of-way, but admitted it didn't have the strength to fight the bill through the legislative maze this year.

First proposed in 1948, the plan for the conveyor has been fought in public and private forums since that time (ENR April 12, 1951, p. 24).

HIGH ROAD?—Unexpectedly higher land prices may throw a solid block into Washington State's plans for construction of a 12-mi stretch of highway between Ephrata and Larson Air Force Base. The section would be the first part of a projected 47-mi north-south Columbia Basin highway.

Land prices have climbed not because of the highway program, but rather because Boeing Airplane Co., announced plans to test its new B-52 bomber at the airbase (near Moses Lake). Possible housing sites immediately jumped about 10% in asking price. Highway officials anticipate "quite a few" condemnation actions as a result.

STATION BREAK—New York State's Thruway Authority was happy with results of its plan to make more than one kind of gasoline available to motorists.

To date, the authority has received competitive bids for 20 of the 27 gasoline stations to be built along the 400-mi route, and has awarded separate contracts to producers of six brands of fuel.

Highest bid (for payment to the authority) was 7.57 cents per gallon, by Atlantic Refining Co., for a station at Amsterdam.

JUST SUN AND SAND—Announcement by the Bell Telephone Laboratories that a solar activated battery has been developed—to generate electricity directly from the sun's rays—immediately poses a great many questions. Once the engineering and cost problems of production are ironed out, will all the new power plants in sunny climes involve acres and acres of razor-thin silicon strips, or will, perhaps, the power plant be outmoded, and the roofs of our homes get the silicon treatment to supply our individual needs? The battery is reported to deliver 50 watts per sq yd of surface, or about 240 kw per acre, and silicon isn't hard to find—deserts in the sunny Southwest are virtually made of silica.

They specify Armco buildings easier than bolts

This is an excerpt from a Bill of Materials of Southern Natural Gas Company of Birmingham, Alabama. "STEELOX" is an abbreviation for an Armco Steel Building of STEELOX construction. Reference is simple standard foundation drawing.

		JPL
		x ½" WALL GR A PIPE
		BUSHING
		EX STR WELD ELL
28		ER. 60 BLIND FLANGE
29	5	½" x 3" EX STR NIPPLE T B E
30	2	1" x 3" EX. STR NIPPLE T B E
31	1	2 EX STR BULL PLUG
32	1	16' x 18'-8" STEELOX BLDG DWG RS-17-3
33	1	1¼ 946AW HANCOCK VALVE
34	1	1" 3000# 90° EL
35	1	1" x 6" EX. HVY. NIPPLE T.O.E.
	8 LF	4" L FOR BRACING
	2	3½" x 5 3/8" x 1/16" ASBESTOS RING GASKET
	6	2 3/8" x 4 3/8" x 1/16" " " "
	22	6 5/8" x 10½ x 1/16" " " "
	2	12 3/4" x 18" x 1/16" " " "
	2	6 5/8" x 8½ x 1/16" MALE-FEMALE GASKET
	8	1" x 7¼ TRIPLEX STUD BOLTS @ 2 HEX NUTS EA
	8	5/8" x 3½" " " " @ " " "
	204	1" x 6¾" " " " @ " " "
	24	1" x 6½" " " " @ " " "
		1¼" x 8 3/4" " " " @ " " "

Typical Armco Buildings specified on Bill of Material.

The Southern Natural Gas Company of Birmingham, Alabama, has found that the standard design of the small Armco Steel Buildings is ideally adaptable to many of their requirements. The standardization of these Armco Buildings has made it possible for Southern Natural Gas engineers to specify the quantity and size of the buildings on their bill of materials easier than listing triplex stud bolts.

For installations requiring the many features of the Armco STEELOX Building, it is only necessary for the Gas Company engineers to give the number and size of the buildings required on their bill of materials. With the occasional exception in number of windows required, this automatically specifies the building size; design load; size, type and amount of accessories; and all necessary material to construct a weather-tight building. And whether one or a dozen buildings, all will be identical in material, construction, strength and durability.

WIDE SIZE RANGE, QUICK ERECTION

Armco Steel Buildings are supplied in a wide size range—all mass-produced by precision manufacturing methods. Unique STEELOX panels provide both structural support and finished surface in the same unit. Erection is easy for small crews without previous experience. Installation costs are low.

Write us for more data. Armco Drainage & Metal Products, Inc., 2974 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO

ARMCO STEEL BUILDINGS

WASHINGTON OBSERVER

The Administration's housing bill is held up now until June. Banking Committee Chairman Capehart figures it will be impossible for his committee to take a bill to the Senate before then. Too many questions are getting raised in the "scandal" investigation, which in its first week has brought demands from congressmen for tightening up the rules.

The bill already passed by the House liberalizes government aids across the board. The Senate committee was inclined to offer even more government aid to maintain housing prosperity until the FHA disclosures broke. Capehart's colleagues now will fine-comb the bill to see that safeguards are put in to prevent recurrence of what they see as bad administration of the fix-up and loan guarantee programs.

It's conceded that the rewrite will take some time, and even then Housing Administrator Cole will have to ride herd to get better administration. Firings that have gone on already will continue.

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Title I lenders have gotten an FHA "gray list" of operators who are banned from participating in any FHA home improvement project. The list is made up of those dealers and builders who, FHA claims, have taken advantage of home-owners by over-charging for home repairs. Few reputable dealers are on the list, FHA says; it is largely composed of those against whom there have been repeated, persistent complaints. Those on the list can get cleared by checking out with local FHA office.

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There's construction in the government's "Nike" guided missile program. The Nike is the ground-to-air missile that's being installed around many of our major cities as an anti-aircraft screen. Originally, it appeared that there'd be no building required—that portable launching platforms merely would be rolled into almost any open field. The portability is still there, but in addition, permanent facilities will be built to service the equipment and the men. That means barracks, roadways, storage, and other facilities.

Plans now are being distributed to interested bidders by the Corps of Engineers. And requests for bid proposals are out for bases around the dozen or so cities already earmarked for Nike protection.

•

The Paducah, Ky., atomic plant is going to get some of its power from private companies instead of from added TVA capacity. Some 600,000 kw is involved. And the decision to get added power from private companies would prompt new construction by utilities.

Southern Company and Mid-South Utility Co., would jointly build a 600,000-kw steam-generating plant near Memphis. This would in all probability end once and for all TVA's request to put up a steam plant in the same area to firm up and expand its output.

Final agreement on the contract between **TVA** and the two private utilities is due this week.

•

Add to possible nominees for the TVA chairmanship: William A. Sutherland of Atlanta, Ga., law partner of Treasury Dept. counsellor Elbert Tuttle. Southern Republican leaders figure his appointment would give them political strength in building a party there. The name of former Tennessee University football coach, Gen. Robert Neyland, is also in the pot, too, with Eisenhower still withholding comment.

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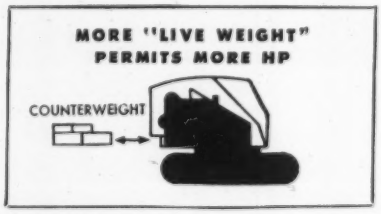

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U.S. to purchase buildings by rent to private builder

Lease-purchase plan raises many questions for contractors and architects as bill goes to Senate-House conferees

Legislation providing for private financing and construction of federal buildings under a lease-purchase arrangement has reached the Senate-House conference stage in Congress. The bill, in effect, authorizes the Post Office Department and General Services Administration to acquire buildings on the installment plan.

The government's need for new buildings for these civilian agencies has been estimated at $3 billion and the lease-purchase device is designed to enable it to whittle down the backlog without having to burden the budget with capital outlays. Annual payments are to be made from yearly funds appropriated for rental of office space. For fiscal '55, the Senate has suggested earmarking $5 million for lease-purchase contracts, which would represent about $50 million in construction.

Contractors, architects and real estate operators, who are acquainted with the plan, have raised a number of points that require clarification. And Congress itself still has a number of thorny issues to work out.

The legislation came to the fore last week when the Senate passed an amended version of the lease-purchase bill adopted by the House last July. Current furor over housing "scandals" influenced the Senate to endorse some added requirements that would slow down—but not hogtie—the execution of lease-purchase contracts. Conferees of the two houses might loosen the added restrictions, provided the House members are not too swayed by the current housing investigations.

Senate amendments would require prior clearance of each proposed lease-purchase agreement by the Public Works Committees of both houses before the GSA Administrator or the Postmaster General could sign a contract. And Budget Bureau approval would have to be submitted to the committees, along with an eight-point list of required information, before the two congressional bodies would act.

• **Old bill, new amendments**—None of these requirements was included in the bill passed by the House last July. The House measure required only that any lease-purchase contract calling for payment of $50,000 a year be submitted to Congress 30 days before the effective date of the agreement. House conferees normally could be counted upon to hold out for that minimum requirement. They may still succeed in getting Senate agreement to the simplified provision, but the prospects are extremely doubtful, in light of the housing revelations.

Both versions provide the annual payments could be made out of any money appropriated by Congress for rental of building space. But the Senate added a restriction for fiscal 1955 setting limitations on the total of annual payments that the two agencies could contract for during the year—$4 million for GSA and $1 million for the Post Office Department. Annual payments totaling $5 million would mean about $50 million of potential building construction.

• **How the program would work**—Post Office Dept. and GSA would determine on a priority basis what space they need and, after getting any approvals required, would advertise each proposed lease-purchase project for bids. Almost anybody would be eligible to bid on such a contract; the bills passed by the two houses say any person, copartnership, corporation or other public or private entity.

Bids, of course, would be on the basis of annual payments for the term of the contract, which might run ten to 25 years under the proposed legislation. Most contracts probably would be for longer terms, up around 25 years. The contract apparently binds the government for the full term, with title to the property remaining in possession of the contractor-lessor until final payment is made, when title passes to the government. During the term of the contract, the lessor would be responsible for maintenance, repairs and payment of taxes on the property.

• **Bids procedure not known yet**—Neither GSA or the Post Office will announce how it plans to advertise jobs and take bids until after the act becomes law.

That's a question that worries architects, engineers and contractors. If the two agencies follow the practice of the Post Office on its recent bid call for a straight lease (not lease-purchase) contract for a new terminal annex in Seattle, the builders and professional people have cause for concern.

On that project, for a 385,000-sq ft building on straight 25-year lease, the Post Office asked each bidder to submit complete plans and specifications along with his annual rental price. One contractor who refused to bid estimated the total cost of preparing such a proposal at about $15,000, with some $10,000 of that sum for the plans and specifications.

Surprisingly, the Post Office received 17 bids which are now being evaluated. They average about $330,000 a year.

When lease-purchase becomes effective, architects and engineers want the government agencies to use private firms for plans and specifications.

• **Against design bidding**—And they want this work done on government order by a single architect-engineer contractor—not by a large number of separate firms for individual competing bidders, only one of whom can get the job.

The latter kind of architect-engineer

Contract disputes law

Contractors this week were on the way to regaining the right to appeal to the federal courts for review of contract disputes arising with federal construction agencies.

The House on Monday passed its version of the Wunderlich Bill, designed to give contractors this right which was taken from them by a Supreme Court decision giving agency heads the last word on contract disputes, except where fraud is alleged. The House version varied only slightly from the bill the Senate passed last session—and early this week the Senate was expected to accept the House language.

When the bill becomes law, a contractor will again have the right to go to court to claim damages under the law and his contract with the government.

The new law has been made retroactive to cover contractors' claims denied a court hearing since the Supreme Court decision was handed down in 1951.

. . . U.S. to purchase buildings

service for competing bidders subverts the professional approach, as they see it. In effect, it means doing the job on speculation, with only the winning firm getting paid.

Contractors, too, view competition on a design-plus-price basis with great suspicion. The Seattle job attracted a surprisingly large number of bids from building contractors. And other building contractors presumably were involved as participants in some of the newly created corporations that submitted offers. But contractors as a whole greatly prefer to bid on uniform plans and specifications, eliminating the added variable of competitive design.

Where the government does not have a site of its own to use for the new building, competition on sites and on buildings to fit the land would appear to be an inevitable part of the bidding. But most of the sites probably would be government owned. The legislation would provide specific authority for the erection of lease-purchase buildings on land owned by the United States.

• **212 sites ready**—Already the government owns 212 sites for which buildings have been authorized. Perhaps more important, drawings are substantially complete for the buildings to be erected on some 100 of the locations. When fully developed with the structures proposed for them, the 212 sites will represent an investment of nearly 200 million.

Virtually all of the 212 structures will provide space for postal use, but only 40% of the buildings can be described as single-purpose postal units. Overall the general-purpose post offices are smaller structures, while the general-purpose federal office buildings run to larger sizes.

Sites now owned are part of the 531 authorized for acquisition by the Public Buildings Act of 1949. Included in that number were 200 reauthorized from a similar 1937 act.

Some senatorial critics assailed the bill as a pork barrel for private investors and builders—even better than the former Section 608 for emergency rental housing. But the government agencies and legislators in general favor lease-purchase as a means of getting needed new space at an actual saving over present rental costs and without increasing the federal debt. Nothing has been done for 15 years, they point out, to meet government needs for its civilian agencies.

Municipal and real estate people attack the bill on one point—that payment of local taxes on lease-purchase property will stop when title passes to federal government. Congressmen have resisted pleas for any special provision to make federal payments in lieu of taxes until after the Commission on Intergovernmental Relations makes its report.

Congressional scoreboard

Here is a report on major construction legislation now before Congress. This ENR service, charting the course of these and other measures yet to be introduced, will be published periodically. Status of the bills is traced by the following symbols: H—House of Representatives; S—Senate; i—introduced; c—in committee; r—reported on the floor; p—passed; K—in conference; E—enacted.

St. Lawrence Seaway	Sp Hr
Niagara power project	Hp Sc
Omnibus rivers & harbors & flood control authorization	Hc
Omnibus Housing (FHA, FNMA, public housing, etc.)	Hc Sc
Highway aid	E
Judicial review of contract disputes (Wunderlich case)	Hp Sp
Big shopping	Sr
Lease-purchase of public bldg	Hp Sp K
Upper Colorado Basin development	Hc
Santa Maria project	Sc Hp
Reclamation projects over $5 million (to be made subject to congressional approval)	Sc Hp
Convalescent Hospital Bill	Hp Sc
Air Force Academy	E

Protest made to Ohio Highway Director over method used to hire consultants

Engineers in Ohio do not like the method being used by S. O. Linzell, director of the Ohio Highway Department, to engage consulting engineers for major highway projects.

His current practice is to ask each of four or five firms of known competence to submit to him on a given date a statement as to what fee it would expect for the engineering work for a specified project. This makes it possible for Linzell and his staff to consider all proposals received at one time and to complete negotiations with one of those firms at an early date.

This method was used in seeking to engage consultants for the engineering work on Ohio Turnpike No. 2 (ENR March 4, p. 21), and now is being employed again to obtain engineers to assist the department with its regular highway construction program.

Recently the Ohio legislature gave the highway department authority to hire outside consultants on projects costing in excess of $1 million. The department has under contract, or planned for contract, 16 such projects involving more than $100 million.

• **Local engineers protest**—Seeking to engage engineers in this way, Linzell states, has brought protests from members of the Ohio Society of Professional Engineers and local members of the American Society of Civil Engineers.

These men seem to believe, he says, "that they should have a chance to bargain over fees rather than compete with one another for these road jobs."

Linzell said he thought it was his duty to obtain the best engineering services for the best price, and that his present method of inviting four or five firms to make proposals is both cheaper and less time-consuming than dealing with one firm at a time." If we followed the suggestion that the department negotiate individually with each firm," the director said, "it would require two meetings for each firm and take up the time of four or five highway officials."

Linzell noted that the department now has a tremendous load of projects to get under way in a hurry and that he does not see "that I am in any way obligated to protect the engineering profession against its own members."

He said that the present system does not constitute formal bidding, and that complications arise even under his current policy for hiring engineering service.

• **Policy under study**—The stand of the Ohio Society of Professional Engineers on this matter has not been formalized. Its Committee on Private Practice, under the chairmanship of Leslie D. Harrison, is studying the matter and hopes to make definite recommendations soon. Informally, local officers of OSPE say that the method employed by Linzell puts too much stress on price. They would like to see more emphasis placed on the reliability of the firms being considered and on the quality of their work.

Mammoth hydro plans mapped in Yukon and British Columbia

Yukon, Columbia, and Fraser river plans for 11,000,000-kw capacity would cost $2.2 billion and benefit U. S., Alaska

Under various stages of investigation in Canada's province of British Columbia and the Yukon Territory are huge hydroelectric development programs which would produce almost 11,000,000 kw at a roughly estimated cost of $2.2 billion.

This is about twice the capacity of all U. S. federal hydro projects in service and under construction in the Pacific Northwest. The cost averages $200 per kilowatt—about half the usual ratio.

The principal rivers that are involved in the plans are the Yukon, Columbia, and Fraser.

• **Ambitious plans**—Soundings are being taken through the ice on Sloko Lake, at headwaters of one of the Yukon River tributaries in northern British Columbia, in an initial survey of one of the most ambitious hydro projects on record. Frobisher Ltd., Toronto, Ont., has plans to develop the Yukon River Basin for the ultimate installation of 3,400,000 kw at a cost of about $700 million.

A parallel plan—proposed last year by the Aluminum Company of America—would harness the Yukon in Canadian territory east of the Alaskan border and turn the water down the Pacific Coast slopes. This estimated $300-million project would have installed capacity of 1,500,000 kw for use in a smelter at Skagway, Alaska.

Frobisher's initial plan is for a dam on the Taku River, near Atlin, B. C.—to produce 75,000 kw at a cost of about $15 million. Alcoa's proposal would divert basin water above Whitehorse, Yukon, into Taiya Inlet and from there to U. S. territory near Skagway, Alaska. Alcoa was the original contender for the use of the Yukon water but its application to do so was turned down last year by the Canadian government.

• **Room for all**—Indications are that there is room for both the Alcoa plan and Frobisher's. A number of discussions have been held this spring between the two companies and with Provincial Premier Bennett of British Columbia. An important objection to the Alcoa scheme has been that its smelter, located in Alaska, would be able to ship aluminum into the U. S. without tariff. According to reports, the Canadian government is against Alcoa using Canadian hydro potential to undercut Aluminum Company of Canada in the U. S. market. Alcan will be producing aluminum in a few years at Kitimat, B. C., using power produced at the giant Kemano project.

• **A joint venture?**—The Yukon power picture may change in the near future, though. British Columbia would prefer to see the basin power potential developed into one big project, rather than through a series of smaller ones indicated by the Frobisher proposal. A meeting held last month in Victoria, B. C., indicated that efforts have been made to induce the two companies to work on a joint undertaking to develop the hinterlands east of Skagway.

• **$400-million dam on Columbia**—On the Big Bend of the Columbia River, 70 mi north of Revelstoke, B. C., surveys carried out since 1944 have indicated the site as feasible for a $400-million dam at Mica Creek. The proposed 600-ft-high dam would impound 15,000,000 acre-ft of water and develop 750,000 kw, utilizing a 1,100-ft head. High cost of Mica Creek would result from the extensive excavation needed to reach bedrock. A long tunnel would be driven through a mountain to take advantage of the potential 1,100-ft head.

RIVERS in western Canada to be developed are the Yukon, Columbia and Fraser.

British Columbia's Lands Minister Robert Sommers told the provincial legislature last month, following conferences with Gen. A. G. L. McNaughton, Canadian co-chairman of the International Joint Commission, that nearly $3 million has been spent in surveys on the Columbia River. He announced the probable starting date for work on Mica Creek Dam as the latter part of 1955, saying that it would require seven years to complete.

Both the Canadian and the U. S. sections of the IJC are expected to give their final approval to the Mica Creek project.

• **Downstream benefits for U. S.**—The dam would be welcomed by the Pacific Northwest states, since it would even out the flow of the Columbia River, thereby adding perhaps as much as 2,000,000 kw to hydro plants in Washington and increasing their power capacity by 30 to 40%.

Final justification for the high cost of Mica Creek Dam depends on cooperation of benefited downstream interests on the U. S. section of the Columbia. Most of the benefits go to downstream plants and sharing of the costs would have to be arranged between the U. S. and Canada.

The Mica Creek Dam proposal came out of studies made by IJC's International Columbia River Engineering Board at the request of the U. S. More than nine dams have been catalogued for the Columbia in Canada in a preliminary report of the board.

• **Storage dams needed**—Need for water storage on the Columbia in Canada was accented last month in an announcement by the Kaiser Aluminum and Chemical Corp. that it is surveying a water storage dam site at the Arrow Lakes on the Columbia. A Corps of Engineers report points out that such a project could provide 9,000,000 acre-ft of storage for the generation of power at dams built or proposed in the U. S. on the Columbia. Last year Kaiser bought about 3,000,000,000 kwh of power from the Bonneville Power Administration, but 40% of it was subject to interruption because of stream flow variations. The threat of power shutdowns in low water years make storage projects on the Canadian section of the Columbia a necessity. Minister Sommers has in-

dicated that Kaiser might build one of the storage dams on the IJC's nine-dam master plan for the Columbia.

• **3,200,000 kw on the Fraser**—Investigations, started in 1949 on the Fraser River in British Columbia, have resulted in a program calling for five dams to be built above Lytton. The program would produce some 3,200,000 kw and cut flood dangers, all at a cost of $800 million. The investigations on the Fraser, including its tributaries, the Thompson and the Clearwater, have been under the direction of the Dominion Provincial Board of the Fraser River Basin. To date $750,000 has been spent on the surveys. In the plan is a $16-million project on the Clearwater River which would develop 215,000 kw. A pulp mill proposed for Prince George would provide the basic power demand necessary to make the Clearwater project feasible.

City officials push for tax write-off on air pollution abatement facilities

A parade of federal government and municipal officials favoring an air pollution abatement amendment to the housing bill appeared before Senate committee members last week.

The measure under consideration would allow 100% write-off in five years of costs of air pollution control equipment, provide for mortgage money guarantees, and allocate $5 million for research.

Witnesses ranged from Los Angeles Mayor Norris Poulson to Bureau of Mines Chief Louis McCabe, and included air pollution control officials from Providence, R. I., Detroit, New York, South Pasadena, Calif., and Nazareth, Pa. Every witness during the three days of hearings favored the measure—and this unanimity bolstered the prospects of possible passage of the legislation this year. But it remains a long shot; previous attempts to give tax aid for pollution abatement have failed.

• **Cases in point**—Mayor Poulson reported that a special census conducted in Los Angeles showed a 71,000 population decrease since 1950 in areas menaced by smog, and a 205,000 increase in the rest of the city.

A Detroit city official testified that the main enforcement problem under the city's pollution control law is not from industry, but from apartment house incinerators.

Austin Daley chief air pollution regulation engineer of Providence, reported that a planned housing development on the east bank of the Providence River could be seriously affected by ash from Narragansett Electric's nearby generation plant, which burns pulverized coal

Underlined in virtually every statement was the point that installation of air pollution control equipment is a public service and an investment with no prospect of return. "It is certainly not justifiable," declared Mayor Poulson, that companies "be penalized by the federal government through the present income tax rules which would require this cost to be shown as a capital investment to be depreciated over a long term of years. In fact, my contention is that it is not a special privilege they are asking but a fair deal."

• **May be tied to water pollution**—Despite the unanimity of opinion of officials over the need for the proposed legislation, there is considerable question as to whether it will become law.

The measure was considered by the Banking Committee in connection with housing legislation because air pollution contributes to the blighting of residential areas. But with the advent of the housing scandals, there has been some Capitol Hill speculation that it might be reintroduced as a separate bill. Such a course would raise question of committee jurisdiction; since the measure includes tax amortization provisions, it might logically go to the Senate Finance Committee, which has not been notably strong for similar measures.

There is also a possibility that senators interested in air pollution control, notably those from California and Pennsylvania, might get together with those interested in water pollution control — Wisconsin's Senator Alexander Wiley, for example—and push a joint bill.

Wide World photo

Revamped Brooklyn Bridge to reopen

Historic Brooklyn Bridge will open up its new six lanes of road deck to vehicular traffic on May 3. Reconstruction of the famous suspension span (ENR Oct. 25, 1951, p. 33) is now complete, and the old trolley and elevated tracks have been removed to add two more lanes to the original four. There are now four longitudinal trusses—braced overhead with struts spanning the roadway—where before there were six. The new approach work on the Brooklyn side of the bridge is complete, but new approaches have yet to get under way on the Manhattan side. When all the work is completed, the reconstruction will have cost a total of $7 million.

Rehabilitation—one cure for slums

Possibly a major blight weapon, slum rehabilitation backed by proposed Administration legislation and national groups

New emphasis is being placed on rehabilitation of blighted areas in cities across the country. Though the least spectacular of blight remedies, it is becoming more and more evident that rehabilitation could be the most effective weapon in the slum battle.

Organizations such as the National Association of Home Builders and the National Association of Real Estate Boards—each with a real stake in the success of programs in every city—are giving full support to the movement. The Administration's Omnibus Housing Bill, now held up in Congress by the loan "scandals" (see page 19), provides new incentives.

Here's what the housing bill would do for improvement borrowers:

- Raise loan maximum on a single-family dwelling from $2,500 to $3,000 and spread financing over five years instead of the present three.
- On structures for two or more families, allow either a flat $10,000 loan limit as at present or $1,500 for each family unit whichever is higher, and spread financing over 10 instead of seven years.
- Liberalize the rules under which properties are eligible for FHA financing.

An indication of growing enthusiasm over rehabilitation was the high attendance at a recent NAHB-sponsored Cities Organized Reconstruction Institute held at Trenton, N. J. When first planned, it was estimated that there would be some 30 eastern cities represented, but when the session opened there were more than 150 "students" representing 71 cities from Niagara Falls to Miami and from New York City west to Los Angeles. NAHB is planning other meetings of the institute in Ohio, Texas and California.

• **What can be accomplished?**—Neighborhood organizations dependent upon combined power of religious, business and civil groups, are showing remarkable results in a growing number of cities.

• **Chicago**—The Back of the Yards Council, a non-profit organization operating over a four-sq-mi area and composed of 185 member groups, during the last 15 years has managed to prevent a rapidly deteriorating neighborhood from falling into the slum category.

This potential slum has been prevented, perhaps forever, through the fostering of neighborhood spirit and by cooperation among municipal, religious, business, labor and banking groups.

• **Baltimore**—Blocks of this city have been raised to a level of respectability the hard way. The "Baltimore Plan," highly touted in the press as the cure-all of slums, was started primarily as an experiment to ascertain the effectiveness of neighborhood cooperation in enforcement of the code of minimum standards.

Mistakes were made during rehabilitation of a pilot area that represented the lowest order of slum living, but enough was learned to establish rehabilitation as a potent blight beater.

A non-profit organization called the Fight-Blight Fund, Inc., was formed with a $10,000 capitalization raised by the real estate interests, mortgagors, bankers and business men who wanted the pilot program to succeed. They proved that, properly handled, even small funds can be very effective when loaned to the few families in any area that are financially unable to improve their homes.

• **New Orleans**—With experience gained as director of the Baltimore Plan, G. Yates Cook, now director of the NAHB Housing and Rehabilitation Department, was loaned to the city of New Orleans to spark a conservation program for that city at the request of Mayor de Lesseps S. Morrison.

The New Orleans experiment is beyond the first phase and the demonstration has started a chain reaction that officials claim will wipe out the city's slums.

• **The formula**—According to Cook, here are the tools you need:

1. Citizen's advisory council representing industrial, religious, civic and minority groups.
2. Housing rehabilitation commission responsible directly to the mayor.
3. A separate department in city hall under the commission.
4. A comprehensive housing code and effective enforcement of it.

• **Cost of slums**—Why is rehabilitation a key factor in the battle of the American city for survival?

Forty-five percent of the city's service expenditures are devoted to areas that furnish only 6% of its revenue. A typical example of the cost of blight to one city is a 28-family sub-standard apartment building that furnishes $800 in property tax revenue. There are 14 school-age children in the structure, and the cost of their education alone is $2,800. At this rate, the city loses $2,000 per year at the outset.

• **Is there a market here?**—Two years ago, 56 members of the Washington, D. C., Home Builders Assn. formed a limited dividend corporation and raised $40,000 (maximum holding was limited to $1,000 each).

They bought eight sub-standard brick houses on a block of 105 dwellings in the worst slum section of the city. The eight were just a shade removed from the condemnation stage.

Here are actual figures on a typical transaction: Cost of a six-room brick house, 12½ ft wide x 35 ft deep $3,300 cost of remodeling, equipping and carrying property $4,700

Sales commission	$200
Total cost	$8,200
Sales price	$9,650
Gross profit	$1,450

The group did not do a "plaster-patch" or "broom" job—they completely stripped the buildings and installed bathrooms, kitchens, hot water and heat with enough emphasis on quality of materials and appliances to guarantee another 30 years for the property.

Sales were very slow at first, but since the first venture other projects have been added to the program, and no financing or sales difficulties have been encountered.

There are some problems in this type of construction, (the most serious is land acquisition), and it is necessary to have competent legal assistance, but Herman Schmidt, leader of the home builder group, is continuing his program and is convinced that there not only is a good market in rehabilitation, but great satisfaction in seeing other houses in the uplifted areas undergoing major changes to keep up.

Mississippi toll authority

Creation of Mississippi's first turnpike authority has become almost a certainty since the state Senate passed the legislative measure which now awaits the governor's signature. Initially planned to issue bonds for a $100-million, four-lane toll road as a link in a Memphis-New Orleans turnpike, the toll road measure simply authorizes issuance of bonds for any state toll road which might be approved in the future.

The bill would make the State Highway Commission a state turnpike authority. Mississippi House sponsors, the introduction of the bill, said that the No. 1 goal of the authority is to build the north-south super highway.

Cite waste treatment as industry's job

Industrial waste treatment to prevent air, water pollution should be charged to production cost, wastes conference told

"Industry must accept the philosophy that the cost of treatment of its waste properly should be charged against the cost of production, and the public must be willing to pay these increased costs in the price of finished products."

This was the way Prof. A. P. Black, president of the Southern Association of Science and Industry, opened his organization's three-day 1954 Southern Industrial Wastes Conference on Abatement of Air and Water Pollution, held in Houston last week. The meeting was co-sponsored by the Manufacturing Chemists' Assn. and the Texas Chemical Council.

Professor Black, head of the chemistry department at the University of Florida and a recent past president of the American Water Works Assn., went on to say that major responsibility for pollution should not be laid at industry's door while soil erosion still puts the greatest tonnage of waste into our streams. He also denied that fear of contaminating water supplies is a just basis on which to sell pollution abatement:

"Fact of the matter is that the waterworks industry has kept well ahead of stream pollution."

• **Look before leaping**—Local chambers of commerce should go slow in urging industries to establish in their areas until they are able to furnish all available facts about pollution potentials, warned W. H. Weir of the Georgia Department of Health. Industries likewise should have all these facts at hand before committing major capital to new plants.

Public relations and legal departments can't pull an industry through chronic pollution problems caused by management's failure to take basic preventive measures.

"Neither can local promotion agencies, hoping their site will be the favored one, overlook the snags of potential pollution which have crippled so many ships which were to bring in golden cargoes of new payrolls," he declared. "Local agencies can be of genuine assistance to industries they expect to attract to their area by presenting the water resources picture correctly," concluded Weir.

• **Research must be complete**—William E. Rand, research director of the Stanford Research Institute, suggested that some companies were spending large sums annually to correct pollution problems only after public pressure had become too great, while enlightened companies were saving like sums by anticipating and preventing such problems and carrying out policies in public interest under the guidance of trained company experts. "Research on any process can be regarded as complete only when it has provided, as a part of the project, the satisfactory disposal of all wastes."

Approaching the problem of who, in a crowded industrial area, is responsible for what pollutants, E. J. Stecker and W. H. Shallenberger of the Ralph M. Parsons Co., described how radioisotopes can be used to trace the source, direction and distance covered by pollutants. (This has been tried in tracing from New Rochelle, N. Y., into Long Island Sound. Results there were disappointing; radioisotopes became too dilute to be traced.)

• **Process introduced**—J. W. Schwab and D. C. Edmiston of Texas Gulf Sulphur Co., and G. T. McBride, Jr., of the Rice Institute, Houston, Tex., told how the threatened air and water pollution problem of sulphur mining operations in an urban area was forestalled by processing sulphur mine waste water so that there would be no release of hydrogen sulphide. The product is a stable water which can be received without ill-effect into the adjacent river.

The process consists of mixing the raw waste water with a commensurate quantity of dilute sulphurous acid with provision for adequate mixing and sufficient subsequent reaction time. This process converts soluble sulphides to insoluble elemental sulphur and to soluble and insoluble salts. These can be removed easily by ordinary clarification processes without odor nuisance, and the soluble salts have given rise to no serious problem of stream pollution.

About 300 attended the Houston conference. The group included industrial plant managers and their assistants in charge of anti-pollution work and waste disposal—plus a large number of federal, state, and local government officials interested in the problem.

Redevelopment projects to widen scope; Senate may kill crippling House rider

The Senate Appropriations Committee is expected to kill a House money bill rider that would nullify Administration efforts to give cities more leeway in planning federal aid urban redevelopment projects.

Although the House passed the Administration's omnibus housing bill with a new provision that would make it easier for cities to include a greater variety of non-housing features in their redevelopment plans, it later adopted a housing appropriations bill amendment which virtually limited such projects to housing.

The House rider—which would rule out more than 80 projects due to receive $26 million in federal aid in fiscal '54—inevitably aroused strong opposition from municipal officials. Last week the Senate Appropriations Committee heard protests from Federal Housing Administrator Albert M. Cole and a delegation from New York City headed by Mayor Robert F. Wagner.

Committee members appeared in agreement with witnesses that the rider represents a misuse of an appropriations measure to legislate a housing policy. And, they also indicated that the amendment should be dropped.

The new housing bill eliminates the requirement that a deteriorated commercial or industrial area may be cleared with federal assistance only if the area will be redeveloped for predominantly residential purposes. It substitutes a provision that "the project shall be in accordance with an urban renewal plan to achieve sound community objectives for the establishment and preservation of well-planned residential neighborhoods."

The controversial rider, on the other hand, would limit federal grants to projects whose non-housing features are "those normally essential for residential uses."

It would, in effect, reverse the present trend in urban redevelopment—ruling out civil structures, convention halls, office buildings, industrial structures, and the like.

The House-approved omnibus housing bill is being held up by the Senate Banking Committee, pending further developments in the current investigations of home improvement and rental housing loans.

It is expected that some new safeguards against recurrence of the loan "scandals" will be written into the housing law before it clears the committee.

Waste water: a neglected source of supply

California study urges evaluation of treatment and disposal plants in terms of possibilities for reclaiming waste water

Waste water should be considered a water resource.

This was the conclusion reached in a three-year study of "waste water reclamation and utilization" made for the California Water Pollution Control Board by the University of California's Department of Engineering.

The study, carried out under the supervision of Albert F. Bush of the UCLA staff, disclosed there are about 106 locations in California where irrigation is practiced in the disposal of waste waters; 112 instances where there is a recharge of the underground aquifier; and one location at which industry makes use of waste waters in an industrial process. (This figure, it is pointed out, does not include the hundreds of cooling towers used in industry that can be considered as devices for reusing water that otherwise would be wasted.)

The report noted that in California about 700,000 acre-ft of waste water each year is discharged into the Pacific Ocean and about 350,000 acre-ft is made available for reuse.

Thus, the report states, there are approximately 1,000,000 acre-ft of water per year potentially available for reuse. This quantity is about 10% of the amount of water artificially distributed in the state and about one half of 1% of the total water that falls on the state.

"New plans for community water supplies should include an appraisal of waste water utilization," says the report. "The economic alternatives among methods of sewage disposal should, then, take into account the value of the waste water resource not only to the city but to the entire region."

• **Effluent to the soil**—"A continuing study of percolation of moisture through soils and other porous media should be carried on. The necessity for understanding percolation phenomena lies in the need for protection of underground water from pollution and contamination.

"Where sewage is discharged on soil for percolation, it is not at present possible to determine the exact capacity of the soil to handle the pollution load and to know what effect it will have on the underground water quality.

"There should be considerable advantage in considering the soil as a part of the treatment process, i.e., evaluate the sewage plant performance from the relationship between influent quality and quality of the water just before it enters the ground water table. Standard of quality for this water would be determined on the basis of the ground water use and its dilution potential. The design of the treatment system, which includes the soil as a part of the process, will require this better understanding of subsurface phenomena.

"Evaluation of waste disposal methods on basis of the effluent quality below the ground surface before it reaches the water table is suggested as a procedure so that soil may be used to maximum extent in the treatment process. Eventually the aim should be to acquire enough information to be able to predict, in general terms, the quality of the subsurface water when the pertinent facts about the soil and soil profile are known.

"In making this suggestion, it is realized that the local water pollution control boards will not be able to adopt such a procedure soon. Methods of sampling and criteria for evaluation must be developed further."

• **By-products**—"Attempts should be made to find technical and economically feasible methods of removing salts (particularly sodium and boron) from sewage and industrial waste waters."

The report emphasizes that the demand for water has been increasing rapidly because of increases in total population, domestic use, industrial demand, agricultural demand and cooling water for air conditioning.

"This is particularly true in much of California, where the continued growth of population, agriculture and industry sooner or later will force a modification of the practices in the use of water in order to balance supply and demand. Indeed, there are some districts within the state where the imbalance is already serious."

The study found that the reuse of waters containing mineral and organic waste materials has only begun to be considered seriously.

Some of the reasons for "this lack of interest" are cited:

Availability of large natural supplies of water at low cost in most areas, making it unnecessary to consider reclamation.

Lack of technical information on water quality (chemical and bacteriological) and effectiveness of methods and treatment.

The objection of many to considering the use of water that has recently been used to carry wastes.

The survey was made under a state legislative grant of $25,566. The report has been accepted officially by the Water Pollution Control Board, which will be able to make copies available for general distribution in about two months. The board's office is in the Education Building, Sacramento, Calif.

Waste water deal

Shell Oil to build facility; city to waive water bill

Shell Oil Co. will get water for its plants in Ventura, Calif., free of charge for the next 20 years by building a plant to reclaim waste water from the city's sewage disposal plant.

The oil company will foot the bill for operating the plant for the next 20 years, after which title of the property will be transferred to the city.

Construction of the plant is to start this coming month. To be built next to the sewage disposal plant, it will take waste water now being discharged into the ocean and reclaim it at a maximum rate of 2,000,000 gal per day. Shell Chemical Corp.'s new ammonia plant at Ventura will receive 670,000 gal and the remainder will go to Shell Oil's absorption plant and oil field operations.

The plant will insure a constant supply of water for Shell, the area's largest water consumer, and will ease the drain on water supply in water-shy Ventura.

Site of the water reclamation plant was leased from the city. The plant, designed by Clyde C. Kennedy, San Francisco architect, will be the first such project to be constructed in the West by a private company. Shell has not revealed cost of the project.

Raised concrete strip to divide turnpike lanes

A concrete separator, 4 ft wide and 8 in. high, will divide traffic lanes on the projected 133-mile northeastern extension of the Pennsylvania Turnpike.

It has been favored over the 10-ft-wide grass center strip used for the existing turnpike "partly as a safety feature and partly because it is a cheaper type of construction," according to a turnpike commission engineer.

The 10-ft grass strip was held responsible for many cross-lane head-on collisions in a safety survey conducted last year, and the turnpike commission since has been experimenting with various types of median barriers (ENR May 21, 1953, p. 24).

W. Va. highway commissioner strikes back

Official disputes findings of management consultant survey, denying that state politics is dictating personnel policies

West Virginia's Road Commissioner H. K. Griffith last week rejected in blunt terms the criticisms of his department and most of the recommendations for new policies and procedures contained in a recent management consultants' report.

The report, at which the commissioner directed his ire, was made by Public Administration Service, a nonprofit agency in Chicago. It contained charges that the State Road Commission has been handicapped "by continuous political influence having an adverse effect on all phases of highway activity" (ENR March 18, p. 27).

Griffith charged PAS with having made "wholesale recommendations . . . without thought or regard to their feasibility." He contended that in some cases the firm "recommended procedures that have been tried by this commission and found wanting." "They [the opinions and recommendations] follow entirely too closely the format tagged by the Chicago firm to other states in which similar investigations have been undertaken by that company," Griffith declared in a letter to the governor.

• **Against merit system**—One of the survey report's principal charges was that "political clearance" was hampering the recruitment of young engineers. To this contention, Griffith replied:

"It may be pointed out that a number of the engineers now employed by this commission have a different political faith than that of the present Administration. . . . At no time has an engineering applicant ever been questioned concerning his political beliefs when applying for employment with this commission."

Griffith disagreed with the PAS recommendation for establishment of a merit system for road commission personnel. "We do not concur with this recommendation," he said, "because it is believed that the merit system provides protection for the inefficient employe as well as for the efficient one, and does not permit management to make proper corrections."

• **Equipment purchases**—The PAS report declared that equipment specifications copied from manufacturers' specifications "virtually eliminate competitive bidding" on heavy equipment. Griffith countered with an observation that competitive bidding on the particular equipment desired often cannot be obtained "because of the dealers' franchise established by manufacturers . . . and this is certainly no fault of the state."

He noted that PAS recommended standardization of commission equipment and added: "So far we have not been able to figure out how standardization can be accomplished and yet retain the so-called competitive bidding features so long as dealers' franchise conditions exist. It would appear that these recommendations are very inconsistent."

• **Agrees on fiscal revisions**—Griffith concurred in the finding that there is a need for revision in accounting, fiscal and budgetary procedures of the road commission.

But he noted also that the commission made provision for purchase of equipment to make mechanical accounting possible in its '53 budget proposals. "This item was so curtailed in the administrative budget that conversion was impossible," he said.

Photo by Schell

River site for first atom power plant

On the south bank of the Ohio River (left bank in photo, from lower center to upper left), near Shippingport, Pa., the world's first commercial atomic power plant will be built on a 400-acre site. Although it has not been disclosed when construction work will start, agreement has been reached with the Atomic Energy Commission to have the Westinghouse Corp. build the plant for operation by the Duquesne Light Co., Pittsburgh, Pa., on the Ohio. The plant (ENR March 18, p. 28) is not expected to produce power at costs competitive with existing plants, but will furnish design and technical information for future firm cost estimates.

Jobs in the news

HYDRO PROJECT—The Greek government has awarded a $15-million contract for the construction of the Megdova River Power Project (ENR May 14, 1953 p. 90) in central Greece to Thompson Starrett Co., Inc., New York. The work involves three dams and a power plant. Knappen-Tippetts-Abbett-McCarthy, New York, are consultants.

APARTMENTS—Estimated at $8.5 million, a 1,000-apartment project at Springfield, Va., will be built by Crestwood Construction Corp., Arlington, Va., with own forces.

SHOPPING CENTER—A $4-million shopping center will be built in North Brunswick Township, N. J., by Philip Levin, Plainfield, N. J. with own forces. Kelly & Gruzen, New York, is architect.

EXPENSIVE MILE—A $4.3-million contract for the construction of 1.2 miles of the Major Deegan Expressway, Bronx County, New York, has been awarded by the New York Department of Public Works, Albany, N. Y., to the Corbetta Construction Corp., Inc., N. Y., N. Y. The short stretch of road has numerous grade separations and elevated sections.

DAM—Santa Felicia Dam on Piru Creek, Ventura County, Calif., will be built under a $3.5-million joint contract awarded by the United Water Conservation District, Santa Paula, Calif., to D&H Construction Co., M. H. Hasler Construction Co., Sacramento, and Macco Corp., Paramount, Calif. Bechtel Corp., Vernon, Calif., is the engineer.

The brighter look

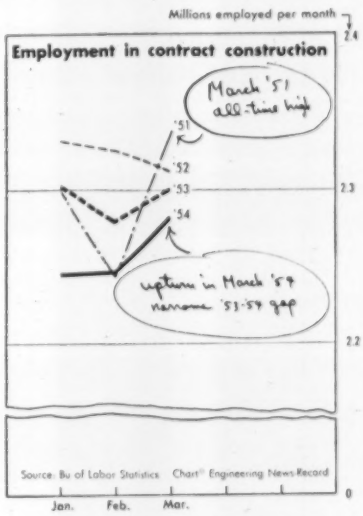
Employment on upgrade, putting new muscle into unions' wage demands

Employment on contract construction climbed seasonally in March to 2,282,000, according to the Bureau of Labor Statistics. This was only 0.8% under March of '53 and within 2.4% of the all-time high for March in '51. Last February employment was 1.4% below a year ago and January was off 2.4%.

The most encouraging development is that there were 1.6% more workers on the job in March than in January, which is the first time since 1951 (the big year for construction employment) that March employment has been higher than in January.

A basis for further improvement in the construction labor market is supplied by the strong upturn since late March in heavy construction contracts reported by ENR. This increase in contract volume will show up in employment figures in the months to come. If this ENR trend continues, construction employment, which averaged 1.6% under '53 in the first quarter of this year, should pull up closer to year ago levels as the months roll by.

A steady improvement in the labor market would have a big effect on the outcome of new wage negotiations coming up in May and June, lending substance to the construction crafts' request for pay increases.



Although total employment on contract construction in the first quarter is still off from last year, the value of new construction put in place is at an all-time high; 2% above the previous high in '53.

However, this relationship is consistent with the tight competitive situation today which has been said to have resulted in higher productivity on the job.

Another factor is cost inflation, although this is limited primarily to building construction. The fact that contracts for some work now being put in place were let at higher prices than work put in place a year ago, would automatically increase the dollar value of the put-in-place figures this year but would not necessarily cause a big rise in employment.

Showdown in Ohio

Wage settlements begin to jell as three of six striking unions sign up

On April 1 a strike of six central Ohio AFL construction unions against the Columbus Building Trades Employers Assn. put the spotlight on a nationwide question: Should labor get another round of pay increases this year?

This week, as the pay showdown neared the month-old mark and idled 4,000 workers and millions of dollars worth of major contracts in the Columbus area, three of the unions involved went back to work for pay raises of from 7½ to 15 cents an hour.

The hodcarrier and laborers local accepted a 7½-cents-an-hour increase. Truckers, too, took the 7½-cent offer, while planning more negotiations to work out new classifications. Painters signed at pay boosts of from 10 to 15 cents per hour, the amount depending upon classification.

But 700 idle carpenters rejected the 7½-cent settlement and asked U.S. Mediator Louis Kahn to arrange a new negotiation session. Another 700 carpenters are still on the job for independent contractors. But these contractors have offered to match any increase given by the association.

The other two trades still on strike—plasterers, cement masons and finishers, and wood, wire and metal lathers—resumed peace talks last Monday. Both may consider 12½ cents.

There has been no picketing, and so far other crafts have not been affected by the walkout. Non-striking electrical workers, for example, ratified a new contract effective June 1.

The Ohio struggle started when contracts expired April 1 (ENR April 8, 1954, p. 27). Arguments from both labor and employers reflected current viewpoints across the country. The contractors said they would pay labor no more than last year. The crafts said they weren't making as much as similar workers in other larger cities.

The six construction unions—representing teamsters, plasterers, cement masons, laborers, carpenters and painters—asked for 25-cent-an-hour wage increases, but later lowered the demand to 12½ cents. The Building Trades Employers Assn.—speaking for about 50 contractors—instructed its representatives to offer no increases.

West Coast unions granted wage boosts

In an agreement with the northern and central California chapters of the Associated General Contractors, the AFL laborers union won a 10-cent package increase and an extension of their contract to May 1, 1961. The new contract will be subject to annual reopening.

Affecting some 30,000 construction laborers and tunnel workers, as well as more than 1,000 building firms, the pact was reached at the end of the third negotiating session.

Workers will get a 5-cent increase May 1, and another 2½ cents on Aug. 1. On Feb. 1, 1955, an additional 2½ cents per man-hour goes to the jointly administered health and welfare fund, to which employers now contribute 7½ cents per man-hour.

Basic wage scale is currently $2 with some classifications making $2.10 and $2.25, and a few groups more.

The existing five-year contract, which was open to yearly review, would have expired April 30, 1956.

• **Northwest too**—Carpenters, piledrivers and millwrights in southwest Washington and all of Oregon except the Klamath area will have uniform wage rates and will get a 10-cent-an-hour increase as the result of agreements with contractor representatives.

Some 14,000 construction workers are affected by the new contract, which sets wage rates, retroactive to April 1 and effective until Dec. 31 at—journeyman carpenters, $2.65 an hour; piledrivers, $2.75; millwrights, $2.90.

States renew drive against closed shop

Legislatures again confronted with demand for right-to-work laws and other measures to restrict union activity

With the National Labor Relations Board and the federal government tending to shift labor matters back to the states, it is apparent that restrictive state labor legislation—and particularly right-to-work laws—will be widely sought again next year when legislatures of 44 states convene.

Since the widespread state adoption of restrictive union laws in 1947, legislation of this type had been getting a cool reception. One exception was Alabama's enactment of a right-to-work law last year.

But already this year (ENR Feb. 18, 195 , p. 275)—and with only 14 states scheduling regular legislative sessions—there has been a rush toward state laws that weaken closed shop traditions.

• **Two new measures**—New laws banning the closed shop and other forms of compulsory unionization have been passed by two states—Mississippi and South Carolina—and an existing law of this kind is being strengthened in Virginia. With the enactment of the new measure, 16 states now have such restrictive laws on the books.

The South Carolina measure, backed by Gov. James Byrnes, was amended prior to enactment to provide for peaceful picketing by strikers and for voluntary checkoffs of union dues by employers. Mississippi's new law—besides stipulating that no person shall be denied employment because of affiliation or lack of it with a labor union—also permits damages, to be collected from employers who refuse to give jobs because of an applicant's union ties. The law will be applied to renewals of existing bargaining proposals as well as to new contracts.

Virginia lawmakers this year put new teeth in the right-to-work law. One amendment prohibits interference with anyone in the conduct of his business because of an open shop policy. Another calls for registration of all union officers with the state's department of labor.

• **Four new proposals**—Meanwhile, organized drives in four other states are paving the way for consideration of measures outlawing compulsory unionism.

In Idaho, a proposed right-to-work bill was filed with Idaho's secretary of state by 20 residents of Bingham and Bonneville counties. Signers of the petition also have formed the "Peoples Right to Work Committee, Inc.," an organization designed to gather the 27,500 signatures needed to place the measure on the November ballot. (A similar proposal failed in the legislature last year.)

A new statewide organization in Louisiana called the Right to Work Council—is attempting to enlist support for a law supporting these views. Its aim is to obtain the adoption of such a statute when the legislature meets May 10.

Kansas' Legislative Council Committee is studying proposals for new and revised state labor laws for consideration at the 1955 session.

Gov. John S. Fine's Labor Legislation Commission plans early public hearings to make an overall study of Pennsylvania's labor relations act. Among those phases coming up for close examination will be the closed shop and union shop.

• **Negative reaction**—Three states have registered a negative reaction to right-to-work proposals.

In New Jersey, proposals for the law so far have failed to gain effective support. And no action has been taken by the legislature on proposals for a state labor relations act, and for revision of the state public utility anti-strike law.

A Michigan house committee again rejected Gov. G. Mennen Williams' proposal for enactment of a new state labor relations law. (Similar recommendations have been turned down at past sessions.) The closed shop and other forms of compulsory unionism would have been banned under another defeated amendment.

Kentucky lawmakers—besides killing a right-to-work bill—also rejected a number of other proposals in the labor relations field, including a so-called "Little Wagner Act." This would have given the state commissioner of industrial relations the power to order, conduct and certify results of union representation elections in intrastate businesses and industries employing more than 10 persons.

Scoreboard by states

A check of state legislatures this week shows the following status of right-to-work laws:

ALREADY ENACTED: Alabama, Arizona, Arkansas, Florida, Georgia, Iowa, Missisippi, Nebraska, Nevada, North Carolina, North Dakota, South Carolina, South Dakota, Tennessee, Texas, Virginia.

AWAITING ACTION: Idaho, Louisiana, Kansas, Pennsylvania, New Jersey.

KILLED: Kentucky, Michigan.

Protest walkout at AEC project in Ohio ends

A walkout of 1,500 members of the hodcarriers, building and common laborers union, AFL, which was reinforced by idleness of another 7,500 construction craftsmen at the Pike County, Ohio, atomic energy project, ended last Friday.

The strike started April 14 over the reported firing of a foreman, and brought all major construction work on the huge project to a virtual standstill. Work on the plant wasn't expected to be back in full swing until the end of this week.

International officers of the laborers union ordered the strike ended, said Joseph B. Lee, industrial relations director for Peter Kiewit, prime contractor, but Paul R. Flavin, local representative for the union denied having received the order.

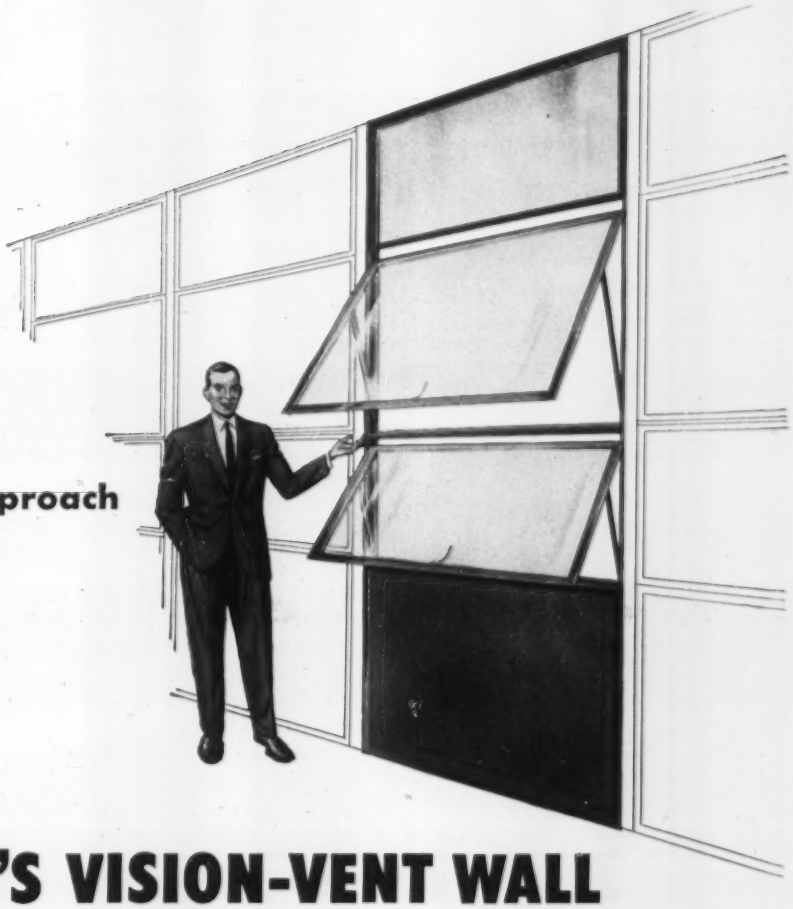
Shortage of materials handled by the laborers was gradually stopping all work at the billion-dollar-plus project. No demands or grievances had been presented by the union, and, after the settlement, nobody would say just what happened to the foreman whose firing allegedly started the walkout.

TVA "force account" hit

Another attack on the Tennessee Valley Authority's practice of hiring its own workers for its construction rather than letting projects out on contract was made last week by C. P. Street, past president of the Associated General Contractors.

He's asked the Senate Appropriations Subcommittee on TVA appropriations to limit so-called "force account" construction by TVA to routine maintenance, repair and emergencies.

Street's main arguments: Other government agencies, such as the Corps of Engineers and the Reclamation Service, contract all their work to private industry, and TVA's wage rates for its own workers force up rates of working trades in the area.



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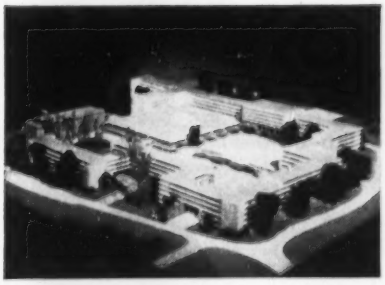

Illustrated is a recent Vision-Vent application at Clemson Barracks, Clemson College, S. C. Lyles, Bissett, Carlisle & Wolff, architects; Daniel Construction Co., contractors. Vision-Vent also is being used for a chain of hospitals.

Vision-Vent is a new building unit with all the mass-production and installation economies of standard steel windows. It is designed to enclose entire walls.

Each Vision-Vent unit is complete. Section includes fixed lights, awning-type ventilators, and insulated steel panels. Elements may be varied to meet functional and appearance requirements.

Insulated panels—in colored porcelain enamel or in stainless steel—have a "U" factor of .197, equivalent to that of an ordinary masonry spandrel wall. Vision-Vent panels retain interior heat. They provide for efficient air-conditioning. Minimum wall thickness—less than 1½"—provides extra square feet of floor space. Light weight is reflected in structural savings.

Erection is done from inside at an average rate of a floor a day. Vision-Vent is weathertight.

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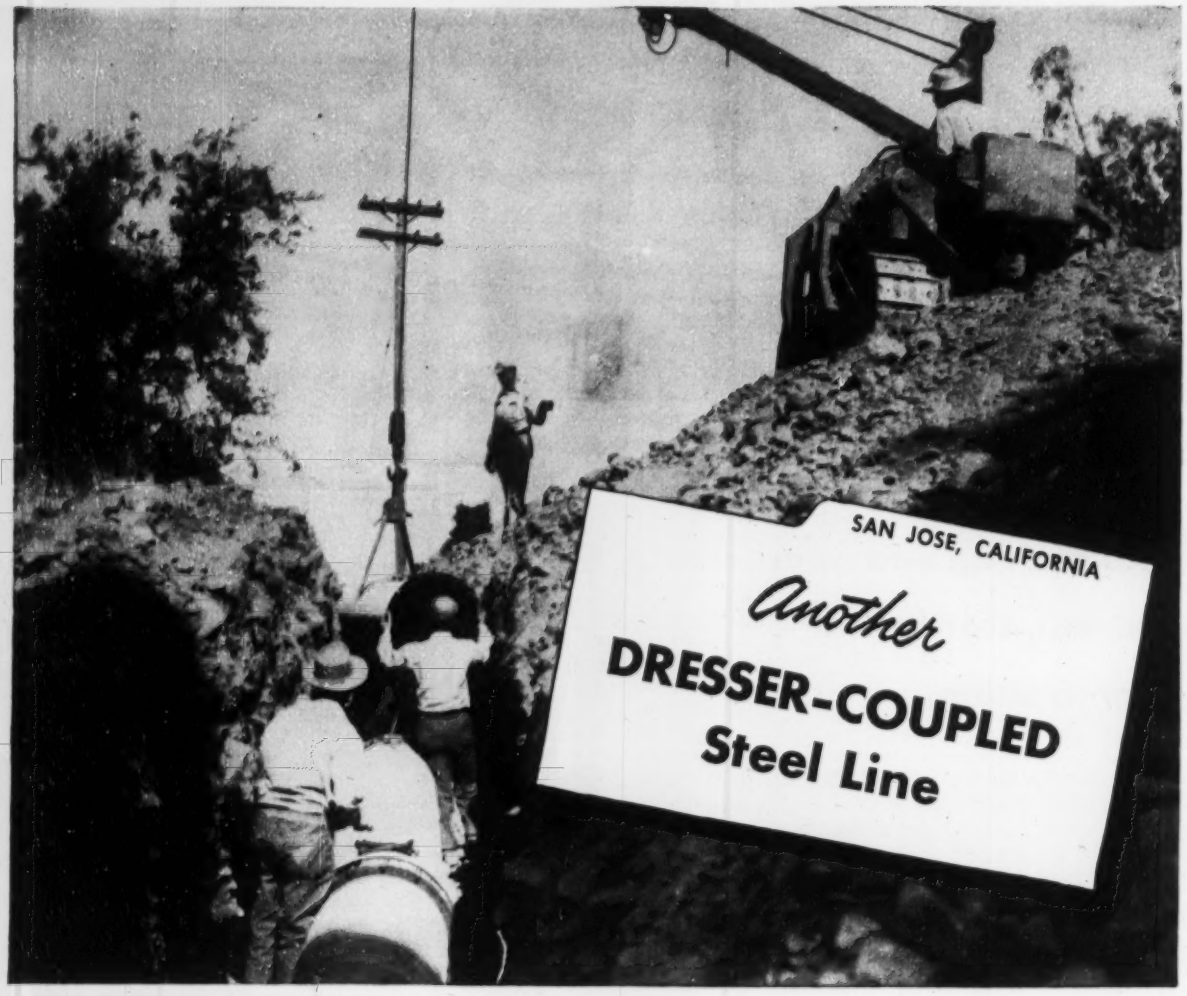

DELIVERS WATER CHEAPER

San Jose installs 12-mile Dresser-Coupled steel line . . . augments water supply from new reservoir.

Crossing the new Water Conservation District reservoir—replacing 8,000 ft. of flume, now submerged—this Dresser-Coupled steel line carries an increased water supply to San Jose, Los Gatos and Saratoga, California. Having installed over 200 miles of steel pipe since 1946, San Jose engineers are well acquainted with the many advantages of Dresser-Coupled construction.

The beam strength of lighter weight steel pipe, plus the resilience of both pipe and couplings, assures a permanently tight line unaffected by surface shock, ground shift or washouts. Rugged coatings make the line impervious to corrosion and incrustation. Glass-smooth pipe linings sustain high flow-coefficients.

Long pipe lengths require fewer joints per mile —reduce laying costs. Small crews, with a minimum of skill, supervision and heavy equipment, make Dresser joints faster, surer—speed construction schedules. This adds up to lower cost, maintenance-free lines.

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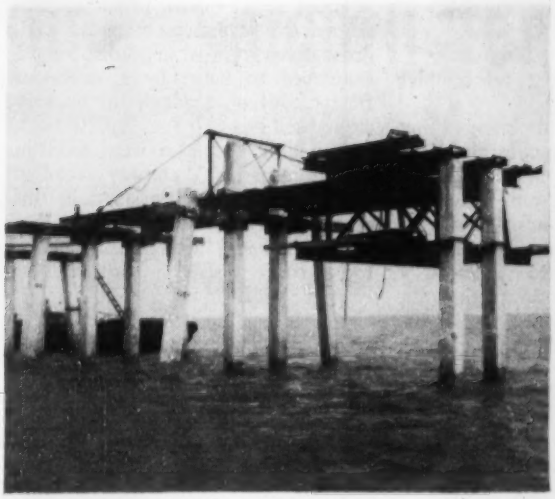
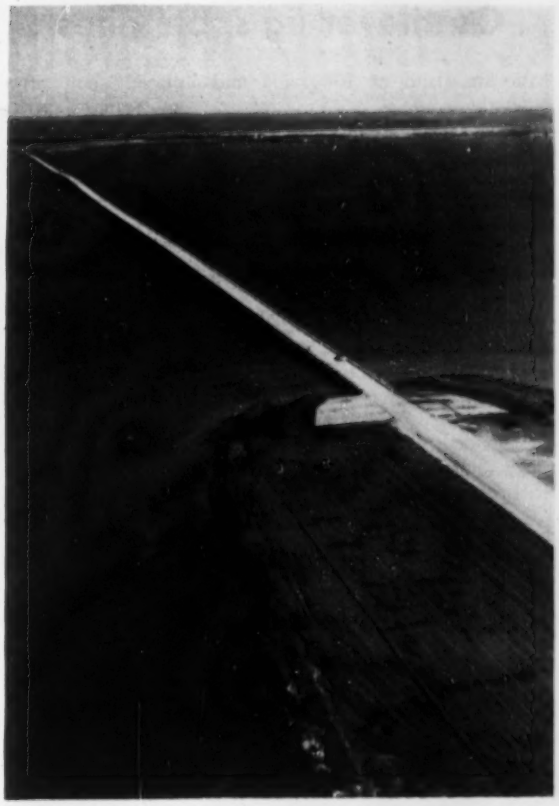


FOR PRECISE PILEDRIVING—Cantilever jig is held on timbers clamped to two previously-set bents.

Building a causeway to new play island



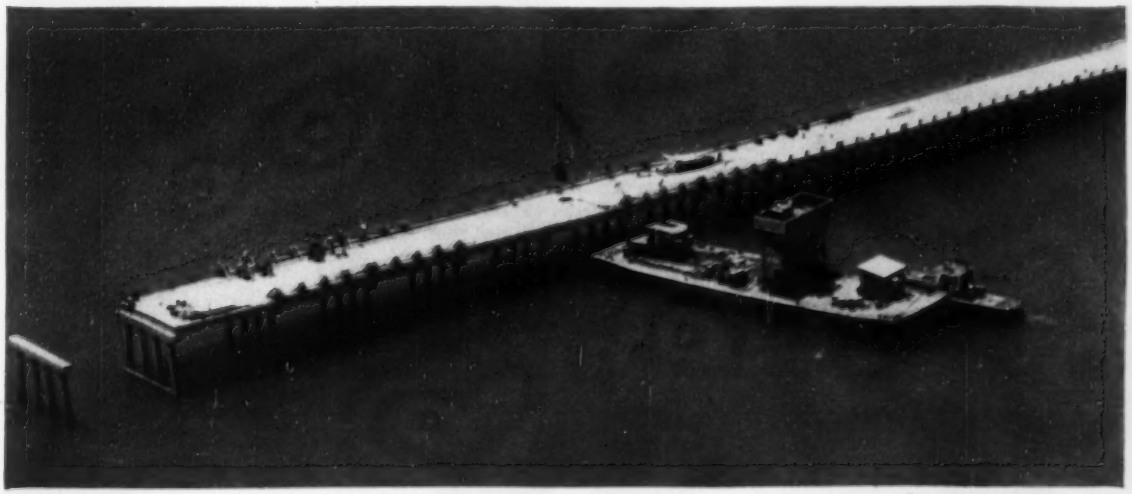
GULF OF MEXICO stretches beyond Padre Island, now accessible via this 1.3-mi trestle. Construction also included hydraulic fill and a canal crossing.

Texas now has new acreage available for development, thanks to a $2.2-million causeway between Port Isabel and Padre Island.

Lest the reader wonder why there is all this fuss about a relatively small addition to the biggest state's usable area, it should be pointed out that Padre Island has a rather special potential: Developers see it as a second Miami Beach, because the island is a long, curving barrier beach separating the open Gulf of Mexico from the Texas mainland — all the way from Corpus Christi down to the mouth of the Rio Grande. Padre's windswept, wavelapped sands should become a mecca for holiday seekers throughout the Mid-continent, they say.

Padre Island got its first break four years ago when a causeway was built at the Corpus Christi end (ENR Mar. 9, 1950, p. 28). The second causeway will encourage development all along the island, taking it out of the dead-end category. In fact, an island-long highway is planned, and there is talk about intermediate causeways

(Continued on page 34)



FOR DECK CONCRETING—Barge-mounted plant held materials for 60 cu yd of concrete—about a day's supply.

. . . Cantilever jig spots piles

to the mainland at Kingsville and Raymondville.

At Port Isabel, which is just about as far south as one can get and still be on the U. S. mainland, the dust and bustle of causeway construction have subsided. A formal dedication of the project will take place in July, and traffic has been using the roadway for several weeks.

Overall project length is 15,272 ft, including 2,700 ft of street paving in Port Isabel (a connection to a state highway), a 406-ft crossing of the Intracoastal Canal, 4,200 ft of roadway on hydraulic fill, a 6,766-ft crossing to the island, and 1,200 ft of approach road on Padre Island.

The 1.3-mi, two-lane main crossing holds greatest construction interest because of the device that positioned the structure's reinforced concrete bearing piles. These piles were placed in groups of four—two plumb and two batter—to form the bents of a trestle. Bent spacing is 30 ft 8 in., except at a small-boat channel, where there is a 50-ft opening.

Heldenfels Bros. Construction Co., of Corpus Christi, general contractor on the project, was using prefabricated steel forms for the concrete roadway atop the bents, so it was necessary to get every bent right where it belonged —or else spend a lot of money trimming and fitting.

• **Pile-spotter**—The device that spotted the piles correctly was a pair of wire rope-trussed cantilever beams with sets of pile guides at the outer end. The center of the jig bore on the previously placed bent, while anchorage took place at the next bent back. Thus, by proper placement of the jig the pile-driving crew could assure accurate pile location. There were two guides for each pile, at upper and lower platforms on the jig's outer end. The guides were steel frames, each with an outboard side member that swung aside to admit the pile, then latched shut to hold it.

Weight of the jig was 17 tons, about the same as that of the biggest precast piles. These were 50 to 80 ft long, 18x18 in. or 20x20 in. in section. Both jig and piles were handled by a large crawler crane (70 tons) on a barge. For a move forward the jig was hoisted clear of the driven piles. For the first and second bents the jig was supported by temporary timber piles at the abutment. Then it rode directly on pairs of 4x12 timbers clamped to the concrete-pile bents.

These timbers also supported forms for concrete bent caps, which were placed soon after the pile-templet jig cleared a bent.

The next step was deck concreting in the prefabricated steel forms. This work was supplied by a floating concrete plant with a one-yard mixer and a crawler crane for bucket handling. The batch bins held enough material for 60 cu yd of concrete—substantially more than the 49 yards required for a single span. However, there were days when it was necessary to go back to the shore yard for more materials, because at peak production Heldenfels placed nine slabs in a six-day work week.

• **Piles cast on shore**—The shore yard was prepared by Heldenfels on the Port Isabel waterfront. Yard features included a dredged berth 900 ft long, a 600-ft marginal wharf, a waterside batching plant and casting beds for the piles. Each of 25 beds had forms for four piles. Lanes between the beds provided access for concrete mixing trucks. A required curing time of 10 days established plant output at about 10 piles daily, which was the normal rate of placement by the pile-driving crew. Cured piles were moved from bed to barge by a sideboom tractor, lifting through a five-grip strongback truss.

Concrete piles also were used in the Intracoastal Waterway crossing. There are seven trestle spans in this crossing. The movable portion is a 160x32-ft barge with a six-in. reinforced concrete slab on its deck. This roadway is 26 ft wide. The barge is swung out of the way of canal traffic by a two-drum hoist powered by a 100-hp engine. Four electric chain hoists are used to adjust steel ramps at the ends.

The barge was built at Tell City, Ind., by Maxon Const. Co. Subcontractor for piledriving was Scrivner and Richardson, Aransas Pass, Tex. Heldenfels' superintendent was Charles T. Trickey, and Cameron County Engineer J. C. Harris was the owner's representative.

Tolls will be charged on the causeway, which was financed by a $2,750,000 county revenue bond issue backed by tax money. Work began late in 1952.

Latest snow survey cheers California; south portion's water outlook improved

March rains and snow improved water conditions in most areas of California. A report by the state's Division of Water Resources shows the outlook is generally more satisfactory than one year ago.

With the present high degree of integration of major hydro and steam electric plants throughout the state, the report says, the indicated surface water supply will prove to be adequate to meet hydroelectric power requirements.

Between March 1 and April 1, the state's snow survey report discloses, water conditions improved appreciably in many of the areas in which the outlook had been considered unsatisfactory or critical.

The water supply, provided normal precipitation occurs during the remainder of the season (April, May and June), will be near or above normal north of the latitude of Oroville, slightly below normal in the remainder of the Central Valley and southern Lahontan areas and considerably below normal in the Santa Clara Valley, and also in the central and southern coastal areas.

Data available prior to the occurrence of storms during March indicated generally unsatisfactory water conditions except in the northerly portions of the state (ENR Apr. 1, p. 24). However, heavy precipitation over the southern half of the state during March resulted in greatly improved conditions.

Supplemental irrigation water supply from units of the Central Valley Project will be available for that portion of the San Joaquin Valley south of Fresno.

The importation of water from the Colorado River will be required in order to alleviate the shortages that have been indicated in portions of the south coastal area.

Storage in Lake Mead behind Hoover Dam totaled 15,701,000 acre ft April 1, which is 89% of average for the last 10 years and 58% of total capacity. Storage in Lake Mead has decreased by 2,683,000 acre-ft since Oct. 1. Provided near normal climatic conditions prevail during the remainder of the season the April-July runoff of the Colorado River into Lake Mead will be approximately 7,200,000 acre ft and 82% of the 30-year mean runoff.

The report notes ground water levels this spring in most areas of California are lower than in the spring of 1953. Lowering in ground water levels, the report declares, is generally prevalent in many important regions of the San Francisco Bay, Central Valley, south coastal and Lahontan areas.

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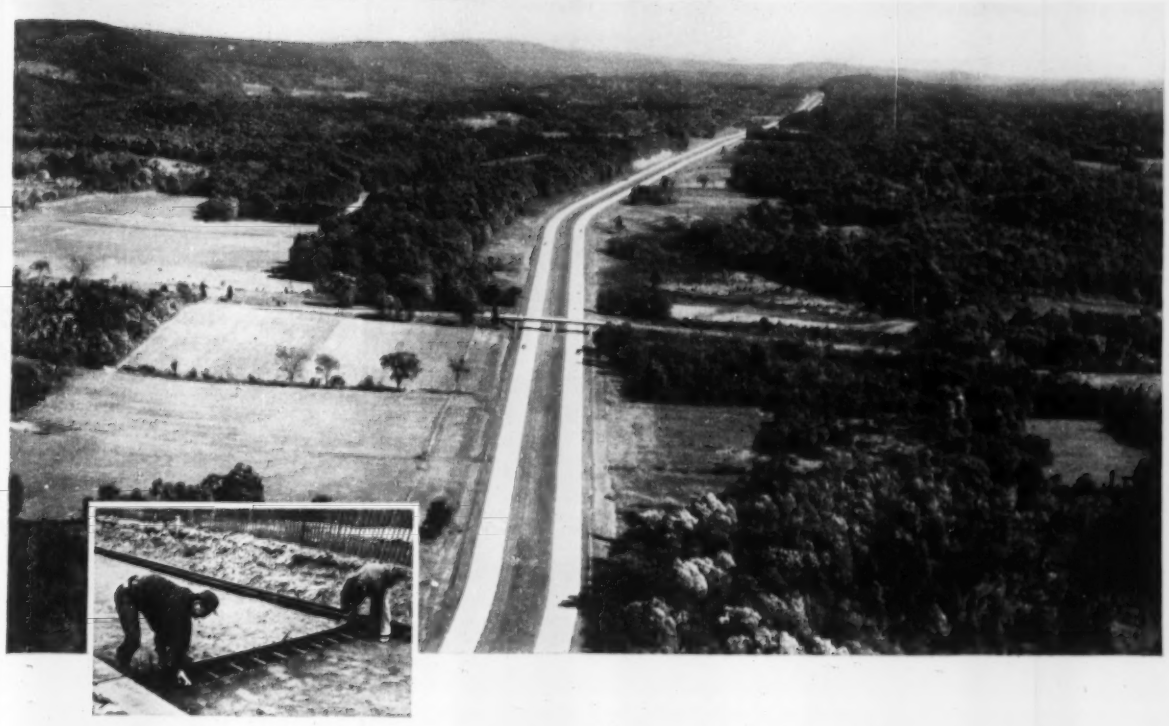

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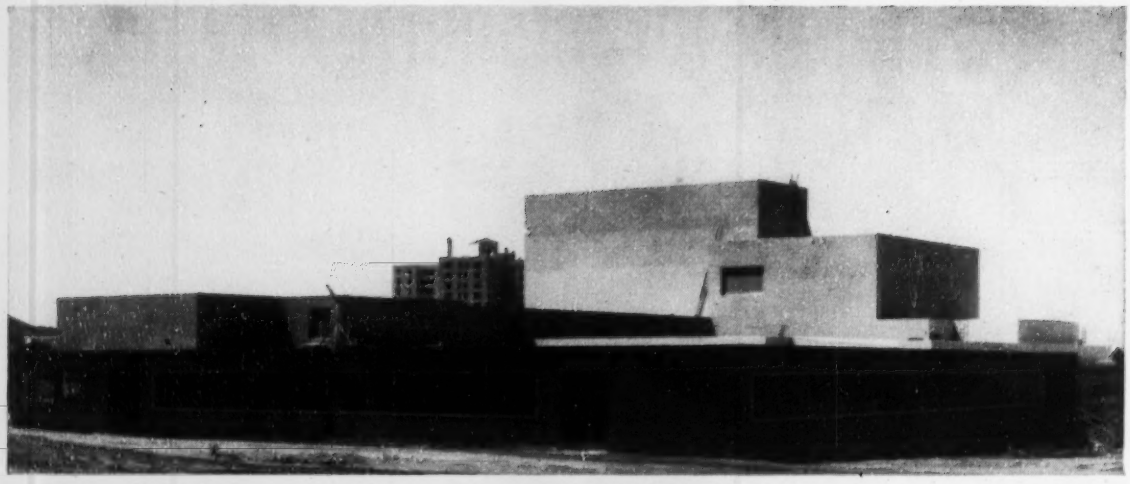


COLLEGES—Clean architectural lines are emphasized by San Francisco State College music building (above).

HOSPITALS—Porterville Hospital to treat and rehabilitate mental defectives.

More people = More buildings

California spends at $50 million yearly rate to keep up with continuing huge population increase

Nearly half a billion dollars worth of state buildings have been constructed in California since World War II—and the work keeps right on going at a rate of more than $50 million a year.

In mid-April, Gov. Goodwin J. Knight signed into law appropriations of almost $48 million for the fiscal year starting July 1, 1954. That's less than has been previously spent. But there are carryover funds that can push the fiscal 1955 spending for buildings close to the $100-million mark, and Knight predicts bigger appropriations in coming years.

Why such a large program? What are the mechanics of design and construction? What types of structures result. Here are some answers to these questions:

The real reason for the big program is population increase.

• **1,000 people a day**—Rate of growth is better than 1,000 people a day—about 40% of this from excess of births over deaths; the rest newcomers from out-of-state. In one year, that would be enough new people to duplicate the population of Oakland, Calif.; Denver, Colo.; Kansas City, Mo.; or Newark, N. J.

And statisticians figure that of each 1,000 new population, there will be at any one time at least one person in prison, at least three mentally ill, one in an institution for mental defectives and about 15 in college.

That means that each year California must provide prison facilities for at least 500 new inmates, mental hospital capacity for at least 1,500 new mentally ill and 275 mentally deficient patients; and classrooms for the 2,000 new students who attend state colleges.

And office space for state agencies must be increased because of the increasing taxpayer demand for state services.

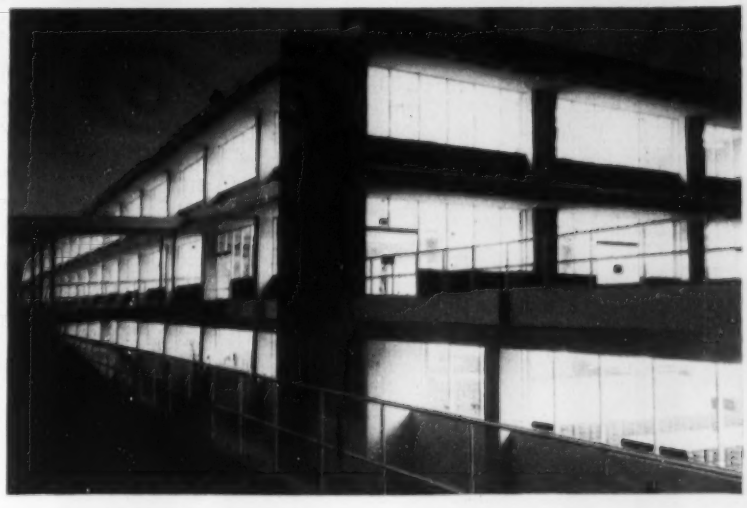
• **Big job, small staff**—The Division of Architecture serves as architectural and engineering consultant on this work for almost all state agencies. It performs much the same function that the Public Buildings Service of the General Services Administration does for the federal government (except that once the buildings are built they are operated and maintained by the individual agencies).

Scope of the division's work can be seen from operations to be started this year: Included are 121 projects for 13 different state departments totaling $65 million.

The range is from $50,000-job—switchboard modernization at Camarillo State Hospital—to a $10-million job—a new office building for the Department of Employment. Included are inspection stations for the Department of Agriculture, fish hatcheries for the Department of Fish & Game, armories for the National Guard, office buildings for the Highway Patrol, exhibit buildings for fairs, state parks for the Department of National Resources as well as prisons, hospitals, colleges and other facilities.

The Division of Architecture has a relatively small budget of its own covering only some 35 administrative personnel. Funds supporting the balance of the nearly 900 people working

PRISONS—Medium security unit (above) at Soledad cost $10.4 million and houses almost 2,000 prisoners.



OFFICES—Department of Motor Vehicles unit houses auto registration records.

on new construction come from legislative appropriations for specific jobs. For example, if the Department of Corrections gets an appropriation for a new prison, the funds are made available to the Division of Architecture. The architectural, engineering and construction supervision services of the division cost less than 8%. The rest goes into construction.

Not all design work has been done by the division personnel. A total of $107 million of buildings has been designed by outside architects under contract to the Department of Public Works. But most of these were designed during the three-year period starting in 1948 when the state caught up with construction deferred by World War II.

• **Do-it-yourself**—As can be imagined, outside architects have wanted more of the work to do. But a provision of the state constitution says that such work can be let out only when the Division of Architecture staff is not large enough to take it on.

The Attorney General and the State Personnel Board interpret this provision literally and in each instance the board attempts to recruit the necessary staff for such overload work. And the recruiting extends to national advertising in such publications as ENGINEERING NEWS-RECORD. This resulted in a large expansion of the staff in 1947 and 1948. At the present time there are only five jobs being handled by outside firms.

The University of California is one state agency not served by the division. It comes under a board of regents and, even though funds are appropriated by the state legislature, the regents are free to handle their construction projects independently in any manner they see fit. Architectural staffs have been established for such work at Berkeley and Los Angeles. The postwar program for the university has totaled nearly $150 million spent on eight different campuses.

• **Design features**—What sort of buildings are turned out by a staff handling more than $50 million of work a year? Generally, they are simple, straightforward, functional designs.

The various departments are all hard pressed for facilities, and want to stretch money as far as possible. And a dollar-conscious legislature would tighten purse strings at the first sign of extravagance. The result is building with no architectural embellishments: functional plan layouts. External treatment consists of form plus whatever color can be put on in paint.

Structurally the buildings are in line with current trends. As one designer puts it, "We try to stay close to general practice. We can't risk being the first to try a new design technique, but we don't mind being among the first half dozen or so."

Included among the techniques employed have been these: prestressed concrete girders for a livestock exhibit hall roof structure, tilt-up concrete walls on precast concrete rigid frames, for a state fair building, lightweight concrete on a new capitol annex, high tension bolting of the structural steel frame on the new employment building and plastic coating on exterior plywood panels for water tightness on school buildings.

Designs usually follow the uniform building code of the Pacific Coast Building Officials Conference although no law requires this. Extra caution is used for prisons and hospitals where occupants may not move freely. This is evidenced by incorporating in the design such things as four-hour fire resistance and conservative earthquake factors.

(*Continued on page 38*)

• **Stage development**—Many of the larger programs are carried out as step-by-step developments, to meet growing needs and to keep within legislative appropriations.

Stage development is particularly true of state colleges. The Department of Education is just preparing to meet the products of the higher birth rate that coincided with the beginning of World War II. Existing campuses are being expanded and new state colleges have been established in recent years at Sacramento, Long Beach and Los Angeles. At San Francisco State College, some new buildings have been erected to only part of the final size. Here both the science and the library building have temporary walls that ultimately will be removed to expand the structures.

A good example of the step-by-step construction is the four-stage development of California Medical Faculty at Vacaville, in the north. This unit will serve as a prison hospital for 1,370 inmates, and will have a guidance center for 600 prisoners. The hospital portion will house male prisoners who are drug addicts, tubercular, senile, psychotic, and deviates. The guidance center will take prisoners when they are first assigned to state institutions and retain them for a number of months while they are processed to determine type and location of confinement.

First step undertaken under a $8.1-million contract by Johnson, Drake & Piper, general contractors, provides a basic operating unit. This includes administration wing, several ward and cell wings, kitchen and dining room unit, laundry, boiler house, entrance building, receiving warehouse, firehouse, and part of a garage and service station. This unit is nearly complete.

Second unit now being constructed under a $4.6-million contract by Robert E. McKee, Inc., general contractors, provides additional facilities for the hospital portion of the installation. Included are more cell buildings, and a commissary.

The final step is still in the design stages with the plans nearly complete. This will include all of the guidance center plus such final steps as the hospital rehabilitation unit, maintenance shops, chapel, library and gymnasium.

• **Special job**—Prisons and mental hospitals are pretty much of a specialized business insofar as design is concerned. Standards parallel closely those established by such organizations as the American Psychiatric Association that recommend ward space of 50 sq ft per ambulatory patients, 60 sq ft per tubercular patient and 70 sq ft for a patient just out of surgery. The

GOLD RUSH EXPRESS OFFICE was restored as historic monument.

Division of Architecture has developed standard plans for prison cell units and is toying with the idea of precasting major elements of these cells.

• **Two-block building**—Also included in the design program are such standard structures as office buildings. Perhaps the most interesting now under construction is the Department of Employment office building in Sacramento, two blocks long with a city street running right through it.

This 6-story building has almost half a million square feet of floor area. It will house 3,500 employees mostly engaged in tabulating, accounting, record keeping and administrative functions of the department.

Nearly 700 ft long, the building omits first and second floors at Sacramento's Eighth Street to bridge the street. The 69-ft opening accommodates a 48-ft street and two 10½-ft sidewalks.

Primary elements bridging the street are 27-ft deep trusses at the two interior column lines. These trusses run two full stories from the fifth floor to the roof. At exterior walls 6 ft 6½ in. deep plate girders span the street; three on the north side and four on the south side. Girders are necessary to fit the window module and the continuous fenestration employed.

Aside from the dramatic street crossing, the building design is straightforward. For simpler steel fabrication and connection details, 12-in. columns and 18-in. beams are used throughout. Beams and columns are joined by simple seated connections. The beam-column connections are shop riveted and field bolted. They are not moment connections as other building elements resist such forces. Earthquake forces are resisted by concrete shear walls with loads distributed to them by the concrete filled steel floor decking serving as horizontal diaphragms.

Exterior finish will be exposed concrete. Interior partitions are generally steel studding with taped and painted plasterboard on both sides. Ceiling fireproofing is suspended type with machine applied vermiculite plaster. Roof construction is an absolutely level metal deck with built-up composition roof over a concrete slab.

• **Small jobs too**—Not all work of the Division of Architecture is as big and involved as the Department of Employment office building or the Vacaville Medical Facility. An example of a tricky small job is the restoration of the historic Wells Fargo building at Columbia in the gold rush country.

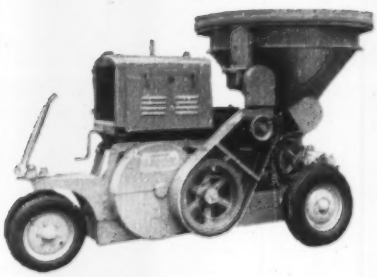
Undertaken for the Division of Beaches & Parks of the Department of Natural Resources, this job involved a 2-story brick building erected in the 1850's. About the only structural element saved from the old building is the exterior courses of the brick walls.

The bricks were soft and deteriorating and some means of protecting them was necessary. After a considerable study a silicone material was found that could coat and preserve the brick. New foundations were constructed; the entire building was cradled in timber and jacked into a nearly plumb condition; and a complete structural frame of concrete was gunited on the interior. But the exterior of the structure looks much as it must have nearly 100 years ago even to still being slightly out of plumb because it was not practicable to remove all evidences of its having been constructed on mixed fill.

• **Personnel**—All of this work takes a highly skilled and experienced group of personnel. Because the expanded program of the Division of Architecture is still relatively new most of the top people have long experience in outside work. For example, the top man—Anson Boyd, state architect—is a graduate of the University of Pennsylvania School of Architecture. He worked for architectural firms in Philadelphia and New York and later established his own office in Los Angeles.

Boyd's principal assistants include his deputy chief Hubert S. Hunter; assistant state architect, administration—W. K. Daniels, Sr.; assistant state architect, planning and design—P. T. Poage; and chief construction engineer—C. M. Herd. The last named heads the structural engineering staff as well as the group of construction inspectors.

Baltimore Ball Park Capacity Increased



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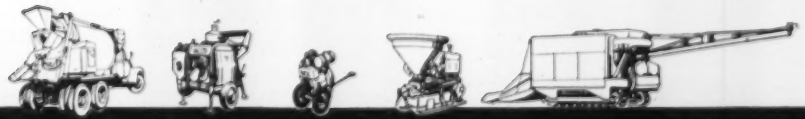

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Nashville Filter Plant

(EXPANSION COMPLETED IN 1951)

THE CHESTER ENGINEERS
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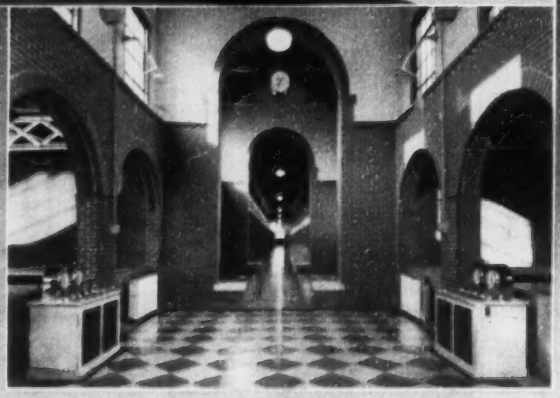
Nashville Filter Plant showing aerator, grit chamber, mixing basins, setting basins, and filter building.

Mr. Robert L. Lawrence, Jr., Director and Chief Engr. Water Works Dept., at the Master Control Table in the original plant lobby.



Filter Operating Gallery.

This 56 MGD Plant is a good example of what can be accomplished through: (1) careful engineering, (2) improved chemical treatment techniques, and (3) efficient operation by means of complete instrumentation and control. These factors have resulted in substantial savings in the cost of treated water at Nashville.

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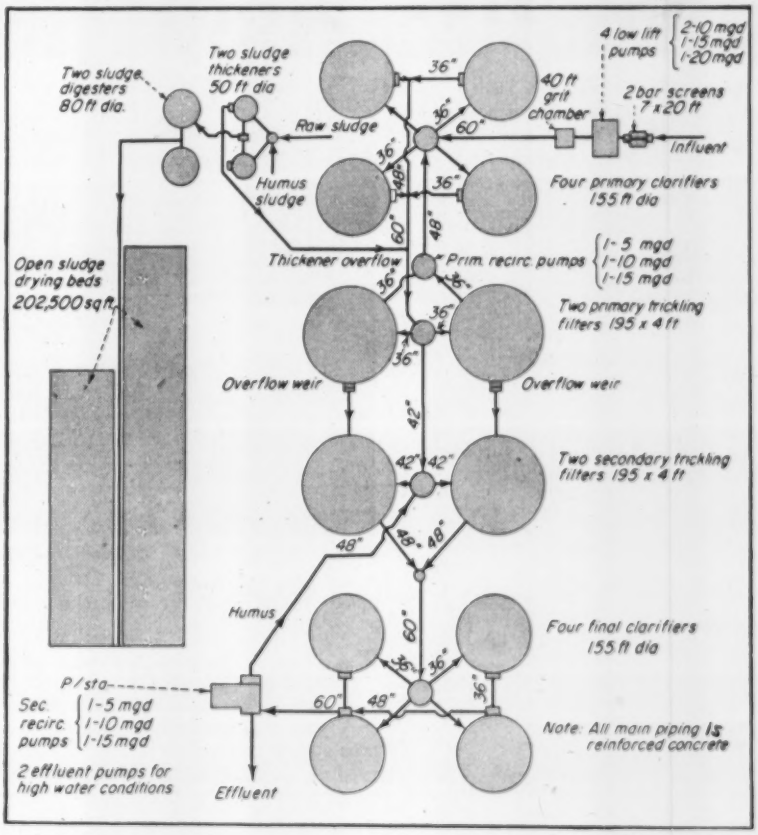
Beaumont sewage works

Design Criteria

Design population—200,000
Design flows:
Domestic sewage, 65 gpcd—13 mgd
Infiltration, central district, 5,400 acres at 1,500 gal/acre/day—8.1 mgd
Infiltration, outside areas, 21,600 acres at 350 gal/acre/day—7.6 mgd
Allowance for commercial development, 360 acres at 3,500 gal/acre/day—1.3 mgd
Total design flow—30.0 mgd
Estimated 1955 flow to plant—13.4 mgd
Estimated 1970 maximum flow—56.2 mgd
Five-day BOD at average flow—136 ppm
Suspended solids assumed—0.2 lb per capita

Thick sludge saves dollars

Plant to use new thickening idea cuts digester size, and volume for bed drying



30-MGD PLANT for Beaumont, Texas will cost $12 per capita or $80,000 per mgd.

Beaumont, Tex., is building the country's first new sewage works to be designed to take advantage of sludge concentration as devised by Wilbur Torpey (ENR Oct. 22, 1953, p. 23).

A $2.4-million, 30-mgd, two-stage, high-rate trickling filter plant has been designed with only 45% of normal digester capacity and with open-air drying beds. Thickened sludge will mean a $120,000 saving in first cost.

Torpey had run a 6-month, plant-scale test at Bowery Bay Plant in New York City, where he is a civil engineer in the Department of Public Works. He had thickened a mixture of primary and high-rate activated sludge to concentrations of 8.3 to 13.5% dry solids. Computations indicate Beaumont can get along with 45% of digester capacity required in state standards by thickening to 7.5 to 9.0% dry solids.

The Texas State Board of Health, after an all-day session in Austin at which full information on the Torpey process was presented, approved plans for Beaumont, subject only to a qualified acceptance of the proposed digester capacity. It was indicated that if operating records of the sludge thickening process substantiate its anticipated performance, the qualification might be removed.

(Design standards of the Texas State Board of Health normally require sewage sludge digester capacity equal to 3.0 cu ft per capita for the design population.)

• **Sludge thickening**—The sludge concentration device to be used by Beaumont is The Dorr Company's new Densludge Thickener (ENR Mar. 25, p. 93) which developed out of the work Torpey has done. There will be two 50-ft tanks with 10-ft swd and conical bottoms; mechanism of these thickeners is of the familiar "picket-fence" type with bottom scrapers.

Thickeners will be fed sludge by two pumps with capacity range of 15 to 75 gpm, each located between a pair of primary clarifiers.

These pumps are exposed and connected to be able to pump from either or both of their respective clarifiers. They will be controlled by time-clock so that the underflow from each clarifier will be pumped the same number of hours each day.

Underflow from the final clarifiers will go to a control manhole, where flow from each unit can be regulated by four telescope valves. From this control manhole, the underflow will be piped to the suction well of three vertical pumps which lift it back to the sludge thickeners.

It is the mixing—in proper proportions—of the underflow from primary and final clarifiers that makes the process effective.

A third sludge pump station adjacent to the thickeners will transfer thickened sludge to the digesters.

Digesters are of the two-stage type with single draft tube mixing in the primary. With thickened sludge fed to the digesters, it is anticipated that supernatant liquor will be almost non-existent in the tanks. The primary digester is to be heated by an external heat exchanger. Beaumont has a most favorable electric power rate so it was considered highly impracticable to recover digester gas for the purpose of generating power. It is piped to waste burners.

• **Sludge drying**—Reduction of sludge volume by thickening not only means economy in digesters, but it also eases the ultimate sludge disposal problem.

Open-air drying of digested sludge will be employed. It is expected that the reduced volume of sludge will dry satisfactorily by this method. Beaumont's average annual rainfall is 54 in., fairly well distributed throughout the year. The normal average temperature is 54.4 deg in January, 83.6 deg in July. About 200,000 sq ft of

(Continued on page 42)

drying bed area is to be provided. Each bed will be 50 x 150 ft and will be underdrained.

• **Low total cost**—On the basis of the $2,387,000 lump-sum contract let to Tellepsen Construction Co. of Houston last November, Beaumont is getting this sewage works for $12 per capita, or $80,000 per mgd. It's a low cost plant.

Beaumont had no existing sewage works, so the installation under construction did not have to conform with any previously established treatment method. The consultants were offered the somewhat unusual privilege of designing a complete 30-mgd plant from scratch, on a site of ample area (100 acres on Hillebrant Bayou). The city only stipulated that the plant require a minimum of skilled labor for operation and maintenance.

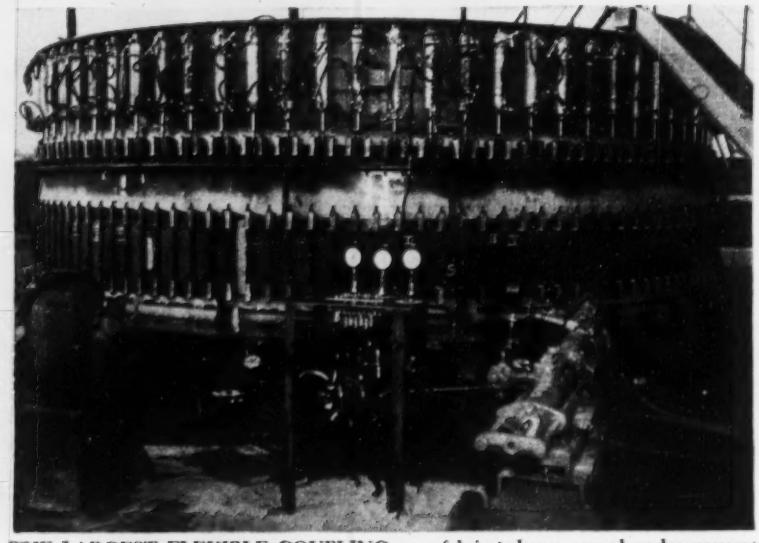
• **Method of purchasing**—It's worth noting that before work started on any final construction drawings for the project, specifications and bid forms were prepared and bids were taken on all major items of plant equipment. These included bar screens; main lift and recirculation pump units; grit chamber, clarifier and filter equipment; sludge pumps; thickener equipment; and all digester covers, appurtenances and heating apparatus, exclusive of valves and piping.

Included as a provision of these specifications was a section notifying bidders that while the city would enter into a purchase contract for the various items of equipment bid upon, it would not receive shipment of any part of such equipment within nine months of the date of such purchase contract. During the nine-month period, the city reserved the right to transfer the contract—with all of its obligations—to the general contractor to whom it might award a construction contract for the plant.

Copies of all proposals under which the city had entered into equipment purchase contracts were included in the construction specifications for the job. Bidders under those specifications were notified that obligations of the city under all equipment purchase contracts would have to be assumed by the general contractor for the project, and that all costs in connection therewith should be included in the lump sum bid for the plant complete and ready to operate.

George J. Schaumburg of Beaumont has been consulting engineer on the project, along with Forrest and Cotton of Dallas. J. D. Martin is Beaumont's city engineer.

Ormond A. Stone, design engineer for Forrest and Cotton was the source of this article.



THE LARGEST FLEXIBLE COUPLING ever fabricated was moved under pressure by a battery of hydraulic jacks. Coupling (lower part of photo) consists of clamps that squeeze rubber gaskets between steel rings and lugs welded on the 1½x24-in. coupling ring.

Testing largest flexible pipe coupling

A prototype of the largest flexible pipe couplings ever fabricated was successfully subjected to motion and pressure in a recent Los Angeles test. The couplings will be installed on the 24½-ft dia Garrison Dam penstocks in North Dakota.

Since flexible couplings of such size are unprecedented, the Corps of Engineers required the test before authorizing manufacture of the 45 pipe joints needed. In the course of the test, a section of pipe was moved 1½ in. in relation to an adjacent section while under 150 psi pressure. Then the pipe units were returned to their original position. All this was accomplished while the pipe sections were in a normal position. Then the test was repeated with small angle (39° min) between axes of the pipe sections.

The test setup for such large units was complex. Pipe sections are placed around an inner steel ring, the upper section supported by 84 hydraulic jacks attached to the inner ring. Then the coupling is tightened around the pipe sections and water under pressure introduced in the annular space between the test ring and the pipe section—coupling assembly, and then the pipe sections jacked apart 1½ in.

For the second stage of the test, half the jacks are first compressed while the other half are extended to produce an angular displacement of 39 min.

The couplings are held to the smooth exterior wall of the pipe by pressure exerted on rubber gaskets by clamps spaced 6½ in. apart around the circumference. The gaskets are 2½x¾ in. in section and are partly wedge-shape. Welded to the inside of the coupling ring (1½ in. by 2 ft in section) are two beveled-face anchor rings. The beveled face of the gaskets is forced against the beveled face of the anchor rings by C-shaped cast lugs that are pushed against follower rings by bolts.

The Garrison Dam penstocks are being fabricated by Southwest Welding and Manufacturing Corp. of Los Angeles. The flexible couplings were designed by R. H. Baker & Co., Inc., of Huntington Park, Calif., who have a subcontract for fabrication of the couplings.

Garrison Dam is the project of the Garrison District, Corps of Engineers, Col. Henry L. Hille, Jr., district engineer.

Three-way shopping spree planned for Indianapolis

Shoppers in Indianapolis, Indiana's capital city, will be going to market with much less effort when three major shopping centers, now planned or building, start operating.

Irving Plaza Shopping Center—a 22-acre, $3-million project on U.S. 40 at the eastern edge of the city—is under construction and some of its 40 stores will be ready this year.

Eastgate Shopping Center—about 10 blocks farther along U.S. 40—will cover 60 acres, contain 56 stores and be completed in 1956 for $7 million.

Glendale Shopping Center, a $7-million, 45-store project, to be built on 50 acres in the northern fringe of the city's residential area, is scheduled for completion in 1956.

First Step To A "Pre-planned" Community:

CLAY PIPE SEWERS

An entire community of *10,000 new homes, 450 acres of light industries, and a complete shopping center* is being planned and built in San Diego. Over 27,500 feet of sewer lines are now being installed by the city. These new Vitrified Clay lines will serve both the residential and industrial areas, assuring safe handling of all future wastes. Contractors are Taylor, Sloane & Solomon, with William Bennet and Gordon Heams supervising the installation of the pipe. Lester Boyle is consultant on the project.

WHEN you have an opportunity to plan and build a whole community from the ground up, naturally you want to use materials of *proved dependability*. That's why city officials, engineers, and contractors all over the country rate Vitrified Clay Pipe first choice for these important sewerage projects. Regardless of the corrosive wastes that may flow through the lines in the future, every section of Clay Pipe is *guaranteed for 50 years.* Industrial chemicals can't weaken it . . . acid gases can't corrode it . . . strong detergents can't soften its rock-hard walls. For sewerage lines that must be permanent, always specify Vitrified Clay Pipe. *It never wears out!*

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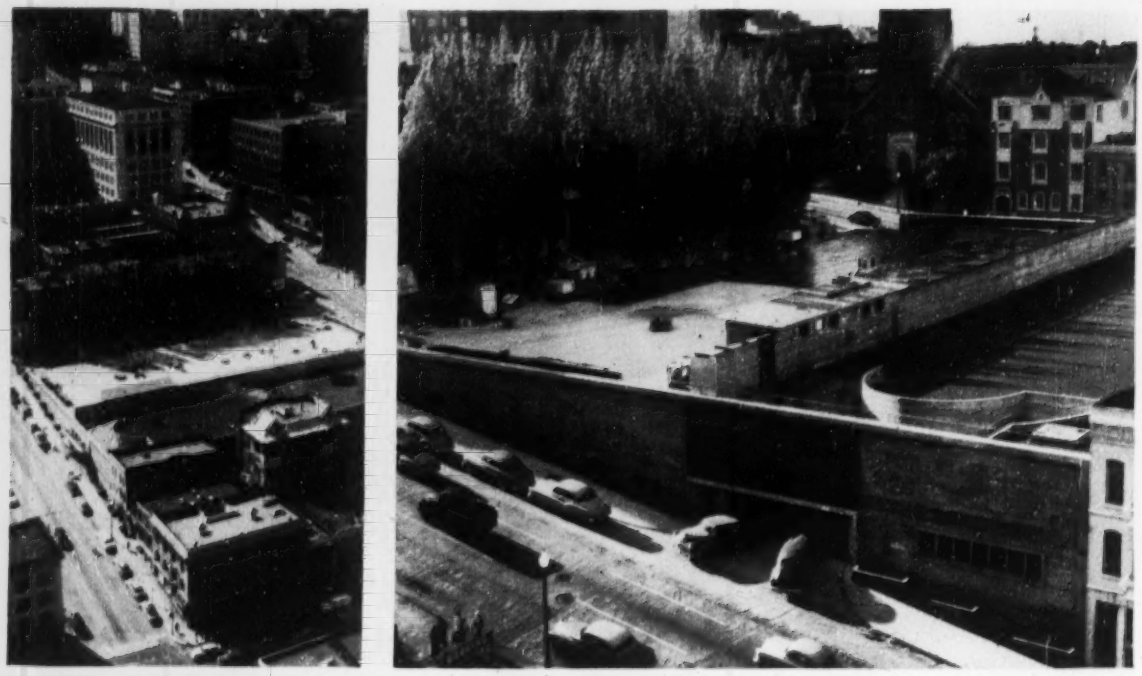


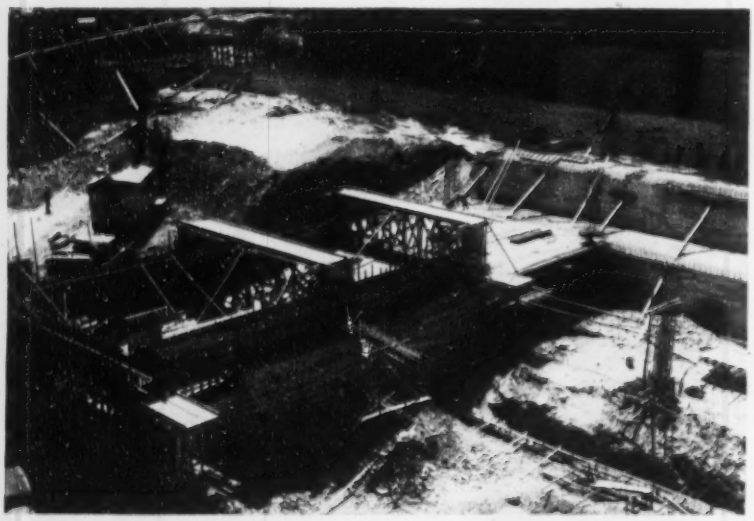
READY FOR BUSINESS MAY 4, partly underground, partly above, St. Mary's Square Garage in San Francisco is ready for business this week. Part of the roof will be devoted to a park area equivalent to that of the old St. Mary's Square.

Design of underground parking garage achieves savings in cost and in space

San Francisco structure incorporates framing system developed to reduce formwork and to minimize shoring

San Francisco's second publicly-sponsored, privately-financed underground parking facility—the St. Mary's Square Garage—goes into operation May 4.

The reinforced concrete structure incorporates a framing system designed around the needs of parking—wide column spacing and flat girders to conserve vertical space—but with economical construction as a parallel objective. Thus, to simplify formwork, the flat girders as well as the slab-and-joist floor system between were made as nearly uniform throughout the building as possible. Also, a set-back, stepped arrangement of the underground floors was adopted, which virtually eliminated the necessity of underpinning adjacent buildings and minimized the amount of temporary shoring required.



CENTRAL RAMPS were constructed first to buttress uphill edge of excavation. Then edge walls (far left) were built, followed by uphill walls in stepped arrangement. This gave maximum protection against slides with a minimum of shoring.

Like its famous forerunner — the Union Square Garage, voted by the San Francisco Section, ASCE, as one of the seven engineering wonders of the Bay area—the St. Mary's Square Garage is built under a city park, which is close to San Francisco's "Chinatown" and famous for its stainless steel statue of Sun Yat Sen, China's "George Washington." After construction, park and statute will be replaced atop the garage.

All this was made possible through cooperation of the city's parking authority and its park and recreation commission. Land under the park (34,375 sq ft) plus 27,039 sq ft additional was made available to private developers on a long term lease basis, with the garage structure reverting to the city after the lease period. The most attractive offer was a 33-year lease returning $1,225 a month or 4% of the gross operating income whichever is greater. This bid was made by S. E. Onorato, Inc., and W. & B. Realty Co. (By comparison, the Union Square Garage reverts to city ownership after 50 years, and the lease payment runs to only $5,000 a year.)

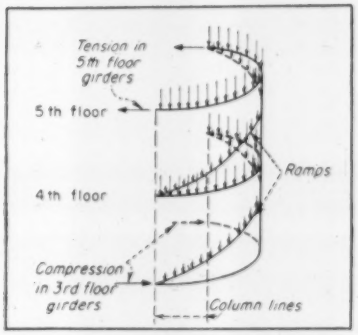
• **Simple framing system**—A basic decision in the framing system was to make column spacing 33½ ft to permit parking four cars between columns instead of the usual three (in a 26-ft space). Columns were made thin, and elongated to facilitate this space saving; in general they are 4½x1½ ft with rounded ends. This allows use of three 15-in. dia spiral reinforcing cages in each column.

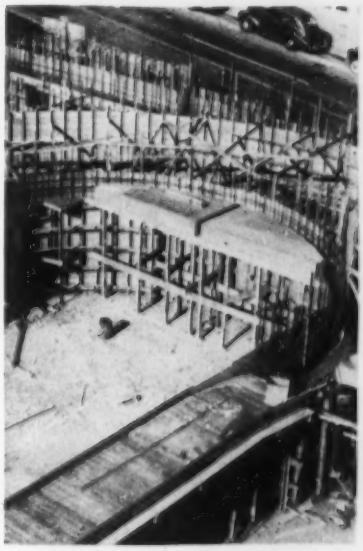
Spanning between columns are the wide (4½ ft), flat (23 in.) girders. They permit floor to floor heights of 9 ft 9 in. All girders are alike except for those on the top floor which support 2 ft of earth fill for the park. The depth of these girders is increased to 34 in.

Framing into the wide girders is a slab-and-joist floor system. Joists are 18½ in. deep and 5½ in. wide spaced 30 in. face to face to permit use of standard 30-in. steel pans. Floor slab thickness is 3½ in. so the steel pans can be a uniform 15 in. deep. Joists are continuous between girders, interrupted only by a single row of bridging at mid-span. The steel pans used required shoring only at each end of their 13 ft span.

By maintaining this system as standard throughout the building, cost of form work was reduced and, according to the designer, there was a considerable saving in concrete. The floor has the rigidity of a 13-in. flat slab floor, but requires concrete equal to only a 8.7-in. floor.

The rigidity of the floor is illustrated by a dead load deflection of only ⅛ in. at girder midspan when the shores are removed. Some of this rigidity is attributed to the flat girder and, in addition, the joists frame into the girders, giving the joists, in effect, haunched ends for greater equivalent strength.





SEMI-CIRCULAR RAMPS required tricky design analysis. Omission of supporting columns to increase parking area meant that the wall had to be considered as a beam. Analysis considered wall as half bucket shape. The result is tension in the 5th floor girders, with compression in the 3rd floor girders.

• **Excavation procedure**—The garage is not entirely underground, but is built into the toe of San Francisco's famed Nob Hill. Streets on either side have 14% grades, and the hill rises even more steeply above. Thus, an important design consideration was to

(Continued on page 46)

Traffic flow simple too

From a traffic standpoint, one of the main design considerations for the St. Mary's Square Garage is prevention of congestion on adjacent streets. To overcome this, three entrances are provided with deep storage areas. Thus, cars can be stored temporarily while awaiting parking space. This also adds capacity to the garage.

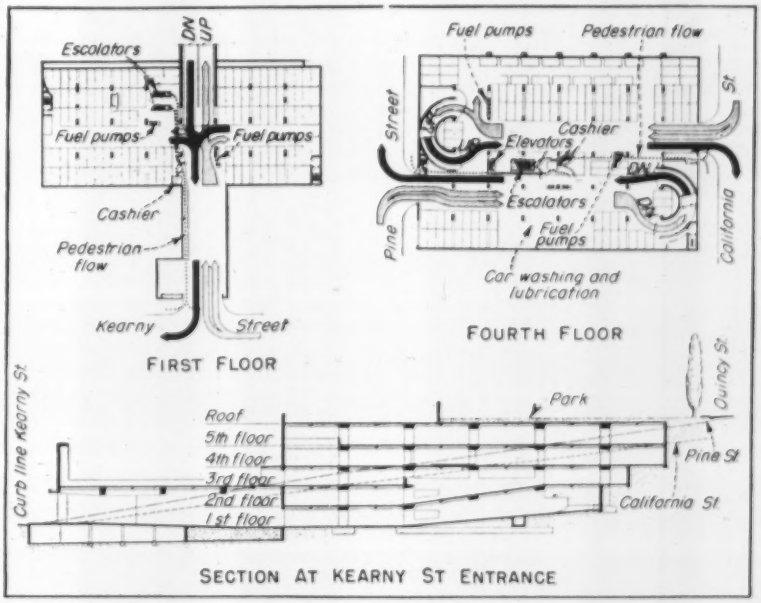
There are 810 regular stalls in the structure. These, together with usable space in aisles and in the storage areas, raises the garage capacity to 1,025 cars.

The multiple entrances also simplify handling of vehicles. Two of the entrances are on the fourth floor, coming directly from relatively steep California and Pine streets. The third entrance is on the first floor, off of Kearny St. This means that 92% of the cars entering the garage can be parked on the same floor or on the next adjacent floor. Only 8%, principally those parked on the roof, have to move as much as two floors.

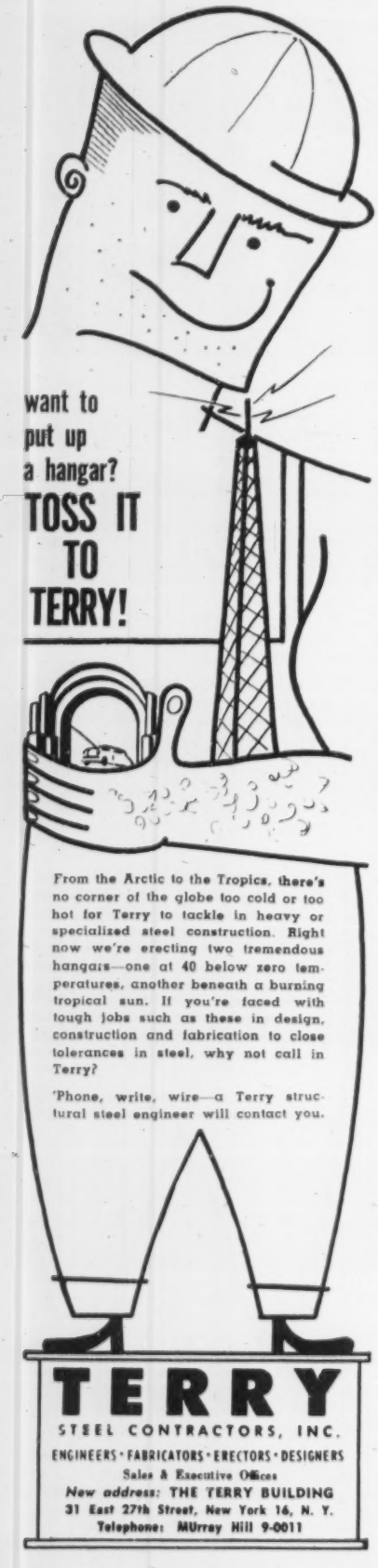
The cashier's booth and gas pumps at the first floor entrance make this floor, in effect, a separate entity. The greasing and washing facilities are all on the fourth floor, so a relatively few cars from the first floor entrance may have to be moved that much.

The new facility is located a short block from the heart of the financial and business center of San Francisco. Anticipating that most use will be made of the facility by persons going to that business area, the designers included escalators connecting the first and fourth floors. That relieves customers of the necessity of climbing a steep hill to 4th floor entrance.

Rates as announced by the operators will be 25c an hour with a 24-hr maximum of $1.25. Monthly rates are $22.50. Those fees are the same, or perhaps a little less than other first class facilities in the same general area.



SIDEHILL LOCATION permits part of a garage to be underground with entrances on two levels. First and fourth floors have large marshaling areas to minimize interference with adjacent streets. Attendants will park four cars between columns.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control excavation so as to reduce shoring and minimize underpinning of adjacent buildings.

The building was located 17 ft from the up-hill property line. This gave added safety to buildings across a narrow alley and eliminated the necessity of their underpinning. It also permitted the saving of a row of poplar trees that were part of the park. It was expected that the roots of these trees would help stabilize the cut bank.

As a further safeguard, third, second and first floors were stepped downhill. This meant that the full 50-ft excavation did not have to be made in one cut at the critical uphill side.

First step in construction was to excavate the center quarter of the area and build that part of the garage to 3rd floor level. Ramps between first, second and third floors and their solid walls made this section a buttress against the uphill side of the area. Then the wall on the south side was excavated to full depth and built. Then followed the north side wall.

Next the uphill walls were excavated and built a step at a time. As the uphill walls were constructed, the remainder of the material was excavated. When wall construction reached grade, the interconnecting parts of the building frame between the central buttress and the outside walls were filled in as quickly as possible. By interconnecting in this way temporary shoring was restricted to a very few heavy timbers that presented minimum interference with normal construction operations.

The heavy earth pressure, together with the necessity for earthquake resistant design meant that careful attention had to be given to lateral force resistance. Lateral forces from the uphill side are resisted by the two exterior walls for the top three floors. For the bottom two floors, walls on each side of the center ramp work with the exterior walls. The floor system is considered as a horizontal diaphragm distributing such lateral forces to the resisting elements.

• **Curved beams**—Besides the design features that reduced construction costs, there were several other design problems of a special nature. One of these involved the design of curved beams—the beams being in fact walls of semi-circular ramps between the 3rd and 5th floors and between the 5th floor and the roof. Ramps below the 3rd floor are straight-line and, being in the middle of the building, give no support to the curved ramps.

The simplest remedy would have been to insert columns to support the ramp walls, but this would have meant eliminating some parking spaces. Accordingly, the interior walls of the ramps were designed as 180-deg girders. This is equivalent to sawing a bucket in half and loading it at the top and intermediate points.

In other words the top part of the bucket puts tension in the adjacent girders and the bottom part puts compression in the girders.

The detailed and involved analysis resulted in addition of very little steel to the wall proper to make it serve as a beam. Additional steel was placed at the joint between wall and girders.

Analysis of the exterior ramp walls was even more complex. It is sufficient here to say that these walls were considered as 45-deg to 90-deg bow girders depending on location.

• **Management**—St. Mary's Square Garage was designed by John J. Gould, San Francisco consulting engineer with Henry J. Degenkolb, chief engineer, and T. D. Wosser, Jr., assistant chief engineer. Associated on the design were G. M. Simonson, consulting electrical and mechanical engineer; Rudolph Igaz, Jr., consulting architect; Eckbo, Royston & Williams, landscape architects; and Dames and Moore, foundation consultants.

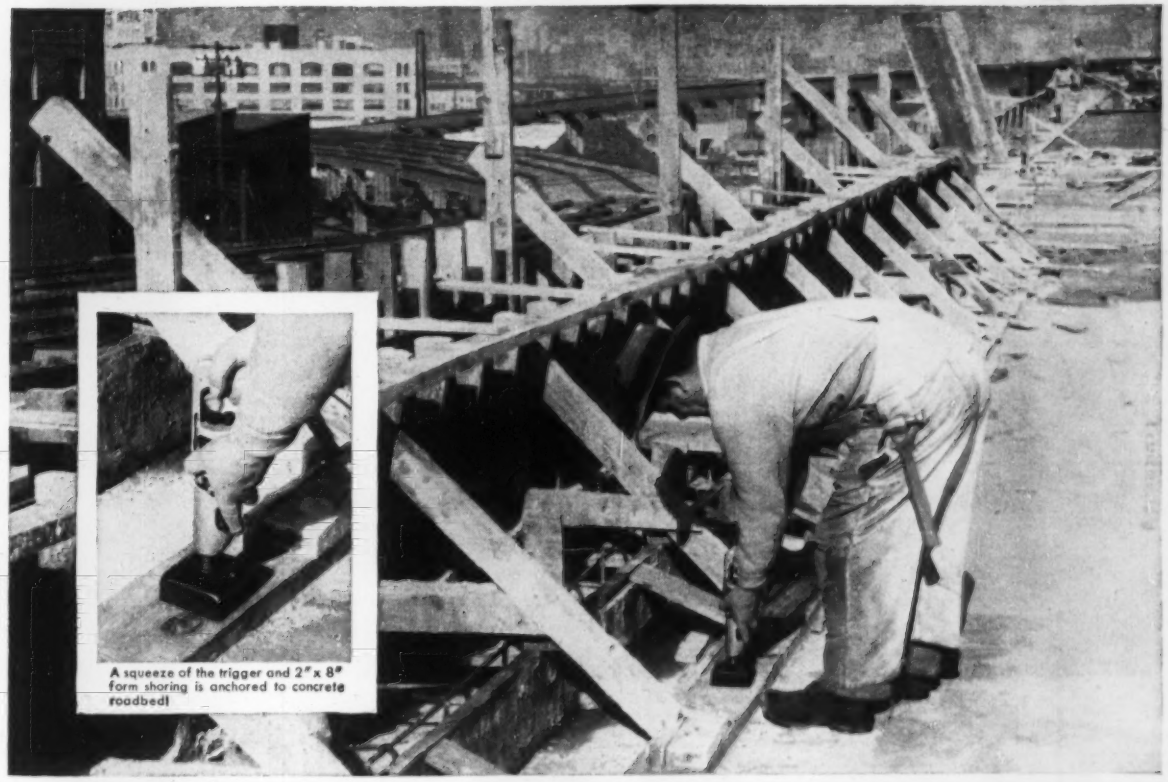
Construction is by Haas and Haynie, general contractors, for whom A. E. McDonald is general superintendent.

Relief wells going in behind Mississippi levees

Pressure relief wells will improve the safety of 150 miles of levees along the Mississippi River from Alton, Ill. to Cape Girardeau, Mo. The Corps of Engineers has begun installation of an extensive pressure relief system which will eventually total some 2,300 wells.

Relief wells are located at selected points dependent on the nature of subsurface soil formations. They will relieve excessive hydrostatic pressures during high water periods and are intended to prevent sand boils and piping. The installations are being made under supervision of the St. Louis District Engineer. The Waterways Experiment Station at Vicksburg, Miss., did field and laboratory investigations and worked on design of the underseepage control system.

So far, 900 wells have been installed under unit price contracts executed by the St. Louis District. Additional wells are expected to be placed under contract during the current and the next fiscal year. The remainder are intended to be completed by fiscal year 1958. Appurtenant work in urban areas, such as collector and disposal systems, are at present under study by the St. Louis District.



A squeeze of the trigger and 2" x 8" form shoring is anchored to concrete roadbed!

REMINGTON STUD DRIVER speeds fastening job on West Coast Highway

TEMPORARY ANCHORING OF FORMS TO CONCRETE can be time-consuming and costly—but it wasn't that way on the new San Francisco Freeway. Here, the Remington Stud Driver did the job in record time by setting up to 5 fastening studs per minute!

The forms were used for pouring the Freeway's railings and curbings after the concrete roadbed had set. A workman simply moved down the base strip with the Stud Driver, and it was securely fastened! When the curbing was in, the forms were removed and the studs broken off below the concrete surface. The small craters that remained were smoothed over with grout.

SAVINGS UP TO 80% IN FASTENING COSTS ARE NOT UNCOMMON with the Remington Stud Driver. Its speed, light weight (6 lbs.), and freedom from wires and hose make it ideal for all kinds of construction fastening. Find out how *you* can save with this powder-actuated tool by mailing the coupon below.

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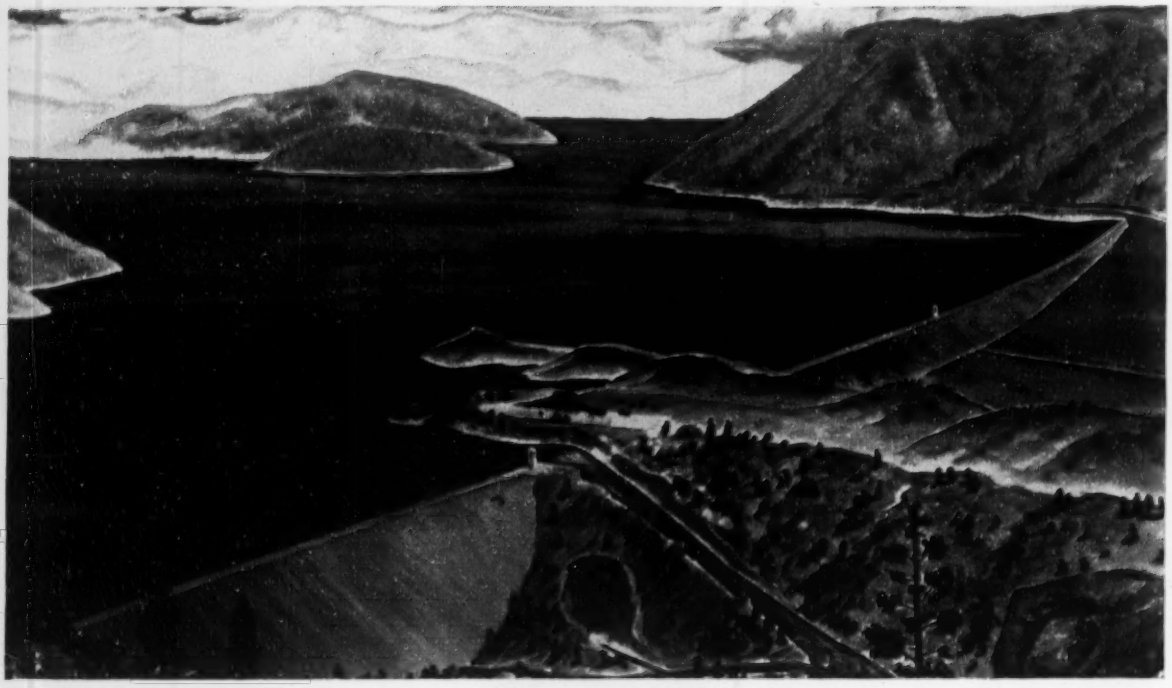

Isabella Dam shows the main dam, lower left, and auxiliary dam at right. Granite hill between the two units has outlet tunnel passing through it and spillway over it. Canal feeding from auxiliary dam supplies a power company with water to turn turbines.

2,900,000 cu. yds. of fill moved quickly on Isabella Dam

CAT* equipment and one of the largest rippers ever built team to build a dam to control the Kern River

Isabella Dam, 1,725 feet in length and 185 feet high, is ready to tame the unpredictable Kern River in California. Its completion relieves Bakersfield of the menace of floods and brings promise of greater irrigation to the lower San Joaquin Valley.

The idea was to regulate the Kern, a river of extremes. Its annual flow varies from 1,900,000 acre-feet to as little as 185,000. To do the job Isabella Dam is divided into two sections: the main dam consisting of 2,900,000 cu. yds. of fill; the auxiliary dam, 100 feet high, 3,325 feet long with 1,800,000 cu. yds. of fill. Separating the two is a hill of granite, through which has been holed the 800-foot main outlet tunnel, and over which passes the spillway.

Macco Corporation, Morrison-Knudsen Company Inc., and River Construction Corporation were awarded a $5,873,782 contract for constructing the main dam, completing the auxiliary dam, realigning a section of the canal and building a spillway. They enlisted the aid of a fleet of dependable, swift Caterpillar* machines to do the job which was designed and supervised by the Sacramento District, Corps of Engineers, U. S. Army.

The 2,900,000 yards of fill for the main dam was decomposed granite. Using Cat DW20 Tractors and matching Scrapers, the contractors hauled a daily average of 25,000 cu. yds. over a distance of 4,000 feet in two 9-hour shifts.

The material was broken up by rippers, including one of the largest rippers ever built. Aluminum irrigation pipe was laid across the broken area. The material was sprinkled for several hours, sometimes as much as 48 hours, after which it was picked up by earth-eating DW20 Tractors and Scrapers. Compaction was obtained by a 50-ton Southwest rubber-tired tamper pulled by a

CAT DW20 AND SCRAPER hauls part of the 2,900,000 cu. yds. of fill needed for the main dam. Contractors used a fleet of DW20s on the job, along with D8s, No. 12 Motor Graders and D13000 Engines. With a haul distance of 4,000 feet, the DW20s carried a daily average of 25,000 cu. yds. in two 9-hour shifts per day. Most of the fill was decomposed granite.

DW20. Working in conjunction with the tamper was another DW20 pulling an 18-foot offset disk.

Rugged Caterpillar equipment entered into every phase of the job. In all, the contractors made use of fourteen DW20s with Scrapers, three DW20s with plows and compactors, eight D8s, two No. 12 Motor Graders and D13000 Diesel Engines to power Gardner-Denver compressors.

From experience these contractors know the dollar-saving advantages of standardizing on Caterpillar equipment. Through this wise standardization, their operators and mechanics become familiar with one make of equipment. There is no need to carry a stock of parts. Many parts on Cat Engines are interchangeable—and service from your well-stocked Caterpillar Dealer is prompt.

Why not have your Caterpillar Dealer demonstrate the equipment that will do your job quicker and cheaper? Discover for yourself the reasons why the machines you see on the toughest jobs are always Caterpillar yellow.

THREE CATERPILLAR UNITS work together on the auxiliary dam. Widening and raising the fill are a DW20 pulling a 50-ton tamper, a DW20 pulling an offset disk and a third DW20 spreading fill for the job.

A CAT NO. 12 MOTOR GRADER finishes the bottom of a canal while D13000 Diesels power Gardner-Denver 500 compressors on top of bank. Graders also maintained haul roads.

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• A complete description of a scraper cable is as long as your arm. But all you have to remember, if you are buying American Cable, is simply: TRU-LAY Streamlined Scraper Cable. And here's what you get, and why—

6 x 25 Flattened Strand—This means six strands of twenty-five wires each wound around triangularly shaped wires in the center of each strand. One flat side of the center wires of each strand faces out providing a relatively flat surface on the strand. The outsides of the six strands together make a smoother surface which gives the rope a much better bearing area against small sheaves and drums.

Independent Wire Rope Core—This adds considerably to the rope's breaking strength, and provides a solid steel core which keeps the rope from pulling down or flattening out on the small sheaves of a carrier scraper.

Lang Lay—When the wires in the strands are laid in the same cross-direction as the strands in the rope, the rope is Lang Lay. This makes the rope last longer because more of the outside wires are exposed to wear. It also makes the rope withstand more bending because of the helix of the wires. The crankiness of Lang Lay is removed by American Cable by preforming.

TRU-LAY Preformed—American Cable's Streamlined Scraper Cable is preformed to make it handle easier and last longer in bending around small sheaves. When wires do break, they stay in place instead of barbing out to slice hands and snag clothing.

Improved Plow Steel—That's what TRU-LAY Preformed is made of. The wire in this all-steel wire rope has an average tensile strength of 260,000 pounds per square inch. Look for the *green strand* which identifies this strong wire rope.

Just ask for TRU-LAY Streamlined Scraper Cable next time and every time you need rope for your carrier scrapers. You can also use it for the blade rope on your bulldozers. Your American Cable distributor stocks it and can give you quick service. Call him today or write our Wilkes-Barre, Pa., office for further information.

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plus ACCO Registered Wire Rope Slings

APPEALING TO THE WOMAN DRIVER, the May Co. parking structure presents no problem for even the most timorous.

"Ramp-itis" is no mental barrier here

Los Angeles store tilts garage building on level site to provide street-grade entrance and exit for all floors

A three-level parking garage, tilted so that each level can be entered at street grade, has effectively solved off-street parking problems for the Wilshire branch of May Co., department store in Los Angeles.

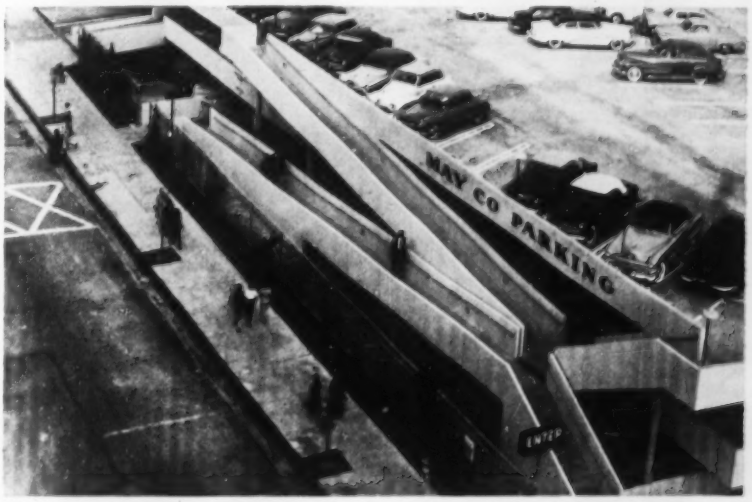
The structure is 513 ft long and 232 ft wide. It achieves the street-level access by a 3% slope on the long (north-south) axis.

Reasoning behind the tilt is this: the building replaces (with accommodations for 1,179 cars) a parking lot that served 500 vehicles. Like the lot, the garage is unattended—customers park their own cars. May Co. and architects Albert C. Martin & Assoc., reasoned that many shoppers—particularly the women who make up the bulk of the store's customers—might be timid about using ramps to the second and third levels, whereas they would drive onto a street-level area with perfect confidence. Since the site was flat, the only way to achieve street-level entry was by tilting the building.

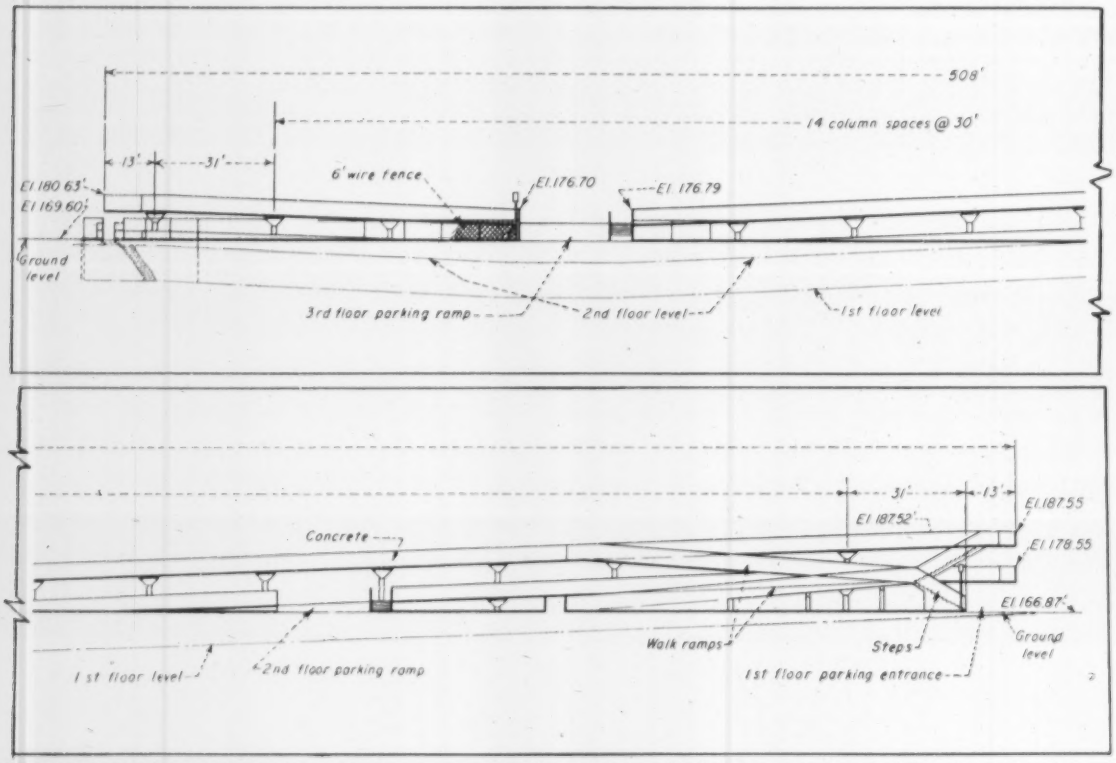
Actually, the building tilts two ways in order to collect drainage for concentrated runoff as required by ordinance. For 382 ft from the southern end the floor runs at a 3% slope to the third level access ramp that forms the apex of the "V", then it tilts up at 4% for 107 feet to the northern end.

Steepest ramps are the entries and exits of the top floor, and they have only a 10% grade. The ramps are 24 ft wide and relatively short (32 and

(*Continued on page 52*)



MINIMUM SLOPE PEDESTRIAN RAMPS are provided at the high northern end of the building to provide access to the higher levels with negligible effort.



BUILDING IS FREE-STANDING, with no connection with retaining walls that form a waterproof box in conjunction with the 30-in. base slab. Ground level varies only three feet in the 508-ft length, but access to any level is at street grade.

38 ft) so they present little or no problem even for the most timorous driver. The 3% slope of the main portion is so gradual that it is barely noticeable while driving inside.

The garage, located across the street from the main store building, provides first-floor ingress and egress at the southern end of the garage. Entrances and exits for the second and third floors are via ramps directly from the side streets on the long sides of the building. Entrances are from the street on the west, exits to the east.

• **Construction data**—The building is of reinforced concrete—10-in.-thick slab floors supported by steel and concrete columns. Hardgrade steel was used for column bars and intermediate grade elsewhere. Concrete is 3,000 psi throughout.

Sides are open except for 3 ft.-6 in. high parapets with a triple function; safety, shielding of surrounding residences from car lights at night, and taking up the differential settlement along the slab edge of the cantilever that extends 13 ft from outer columns on all sides. The roof is the floor of the third story.

Since a square structure is best for earthquake resistance, the upper two floors are divided into separate north and south halves, with an expansion joint between. The joint is made up of a subway grating secured to the south floor slab. A welded plate attached to the grating's north edge slides over another plate secured to the north floor slab. There is allowance for a three-inch sway of both halves of the building.

To prevent development of elevation difference between floors of the two halves during settlement, expansion or earthquake, plates welded to each half are joined in a tongue and groove arrangement under the grating, with allowance for horizontal but not vertical movement.

Free-hanging gutters supported by brackets catch water leaking through the expansion joints.

• **Rigid supporting elements**—Besides separating the garage into two structures, the need to cope with earthquake forces and motion without unduly restricting horizontal movement was considered.

When it was found that conventional heavy columns that would withstand seismic forces would cause severe overstress in cracking under thermal expansion, rigid elements were designed close to the center of the structure where the thermal effect is less.

"Z"-shaped shear walls were developed (six in each half) that carry from the foundation up to the top floor. The shape was chosen for its adaptability to the parking pattern of the building. The 12-ft-long stem of the Z acts as the dividing line between two rows of cars, with vehicles heading into it on either side. The eight-ft wing sections fall along the slanted lines dividing the parking stalls.

They give strong vertical support with flexible resistance to horizontal movement.

Shear walls could have been omitted if larger columns were used, but larger columns would have occupied valuable parking space. Through the use of Z elements, two feet of usable building length was achieved as a bonus. Columns used are 18 in. in the first floor and 16 in. on the second. They are spaced 30 ft on centers axially, and 27 and 33 ft in transverse direction.

To achieve a low story height (9 ft between floors), a large cap was used on the columns instead of drop panels on the ceiling slab. Cap diameter at the ceiling is five ft.

Soil of the site is poor—irregular, watery and oily. To deal with this, a floating foundation was used. The base slab varied in thickness from 16

(Continued on page 54)

Think of Tomorrow's Water Needs Today

Growth—production—expansion—apply those words to city, farm or factory and you find that accomplishment is tightly tied to water. And yet planning for tomorrow's water needs is too frequently postponed until tomorrow becomes—today.

Layne ground water development service is unique in the dictionary sense of the word. A service that may—and frequently does—start with exploration. A service that has no ending—a continuing service—for Layne's responsibility to a Layne project or installation lasts as long as the need for water exists.

That service is available to everyone. It costs no more—and usually a lot less—because from initial surveys and test drilling to completed installation Layne brings to any job of any size the pooled knowledge of nearly three quarters of a century.

The Layne organization is glad to be of service on any immediate phase of ground water development—maintenance or modernization of existing equipment—new pump equipment—drilling—exploration or water treatment.

But also it is wisdom to use that service today in forecasting the needs of tomorrow. Why not permit Layne to make—with your assistance—the plans that will provide a dependable adequate water supply for the years that lie ahead.

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■ Agriculturists will be interested in a free booklet—"Layne for Profitable Irrigation." Sent upon request.

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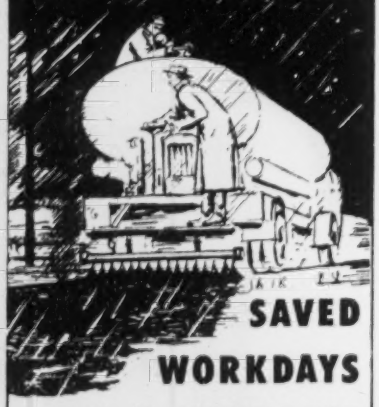

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on N. J. TURNPIKE

During construction of the N. J. Turnpike, penetration courses were shot with **NOSTRIP**-treated asphalt under moisture conditions which normally would have halted the job.

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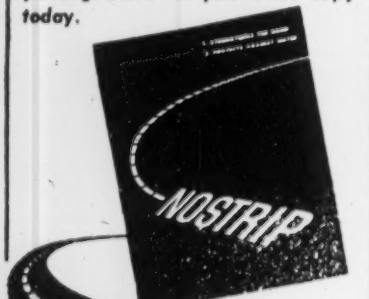

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in to 30 in, and the retaining walls attached created the waterproof box. Weepholes in the walls provide for extreme conditions of water pressure.

Within the box, the structure is freestanding. Second and third floors are at no point tied to the retaining walls. Car ramps at the street end rest on columns standing free from the retaining walls, with expansion joints connecting them to the street.

There are unobstructed areaways of 15 ft on the west side of the structure and of five ft on the east and north. The south side (with no retaining wall) is thirty feet from the nearest building, affording free circulation of air through the structure, thus minimizing the exhaust fume problem.

Each floor has three double lines of car stalls running longitudinally, plus single lines on the sides. On the first floor however the areaway on the west side will be used for two double lines of employee parking. Separating the interior double lines are concrete bumpers, 27 in. wide and 3 in. high.

Traffic will be guided by signs painted on floors, standing signs, and neon signs suspended from the ceiling. Numerous signs will be posted cautioning drivers to set brakes. Slope is only 1.6% at angle of parking.

To keep expansion and contraction to a minimum, blacktop, which would absorb heat, was omitted from all floors, including the top.

The structure was completed in four months by T-S Construction Engineers Inc.

City boasts progress—then proves it

Supporting its claim of being the most progressive little city in the great Southwest, Enid, Okla., is sprouting with "signs of progress"—signs that read "road temporarily closed," "rough intersection" and others—but the people of Enid are not complaining.

In 1952 they voted the bond issue that paved the way for all the activity. Recently completed is a new $915,000 treatment plant, and well along in construction are new and enlarged storm and sanitary sewer lines.

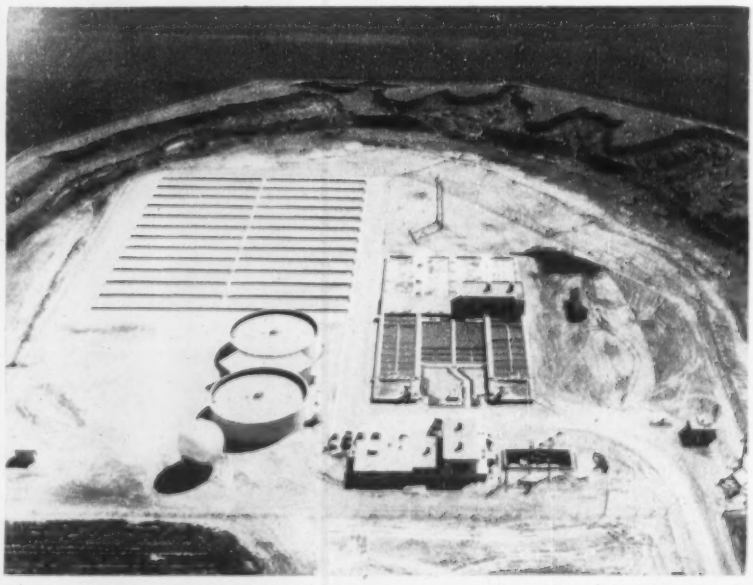
• **Storm sewerage**—Fifty years of growth that outstripped the visions of the early planners resulted in critical problems in disposing of rapid runoff from flash rains that occur in the area without warning. Property damage mounted as the city was developed until a flash flood in 1950 inundated a great section with resulting havoc.

The flood provided the pressure that drove the mayor and board of commissioners to retain engineers to develop a solution of the entire storm sewer problem.

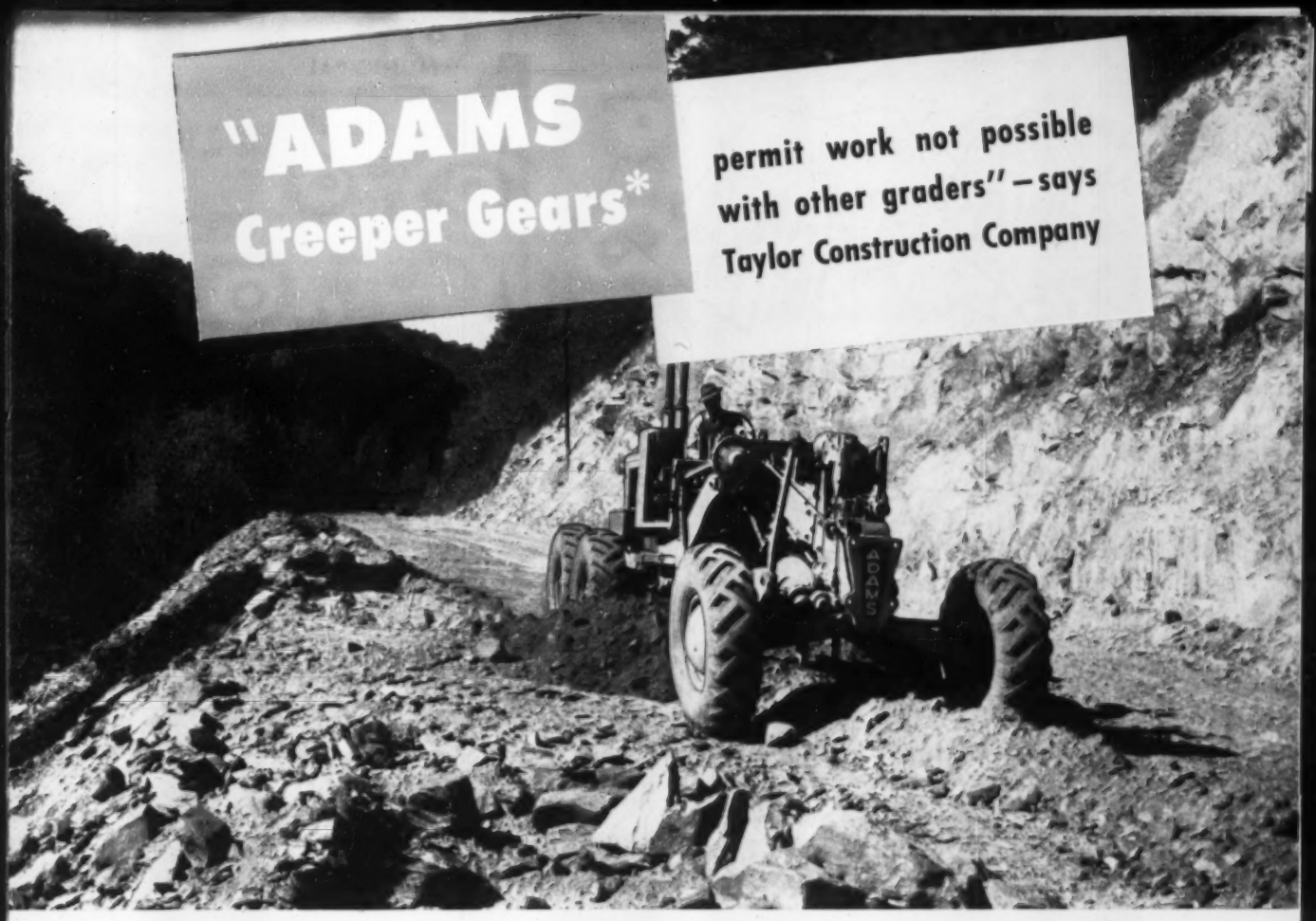
The engineers' report advocated seven and a half miles of storm sewers, 209 inlets, 125 manholes, and removal and replacement of 19,000 sq ft of sidewalk and other items necessary for workable installation of the system.

The plan was approved by Enid

(*Continued on page 56*)



NEW ACTIVATED SLUDGE PLANT replaces overloaded, 35-year-old Imhoff tank.



"The heavy construction of the machine and the wide range of speeds, make our Adams Motor Grader adaptable to many varied conditions. On a heavy rock job in Tennessee (pictured), the low creeper gears allowed us to work under conditions other graders could not match." Thus reports Baxter Taylor, Taylor Construction Company, Asheville, N. C.

Adams Improved Motor Graders have many operating advantages which contribute to their greater work capacity —such as *8 Regular Forward Speeds, With High Transport Speed; 4 Reverse Speeds; Dual Braking System; Foot Accelerator.*

For a new experience in motor grader performance, ask your local Adams dealer for a working demonstration. Convince yourself that Adams Motor Graders are to-day's best buy.

J. D. ADAMS MANUFACTURING CO., INDIANAPOLIS, INDIANA

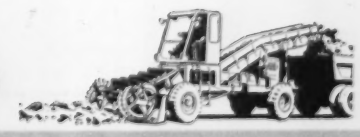
* ADAMS Creeper Gears (Optional)

Provide speeds from ¼ to 1¾ mph.

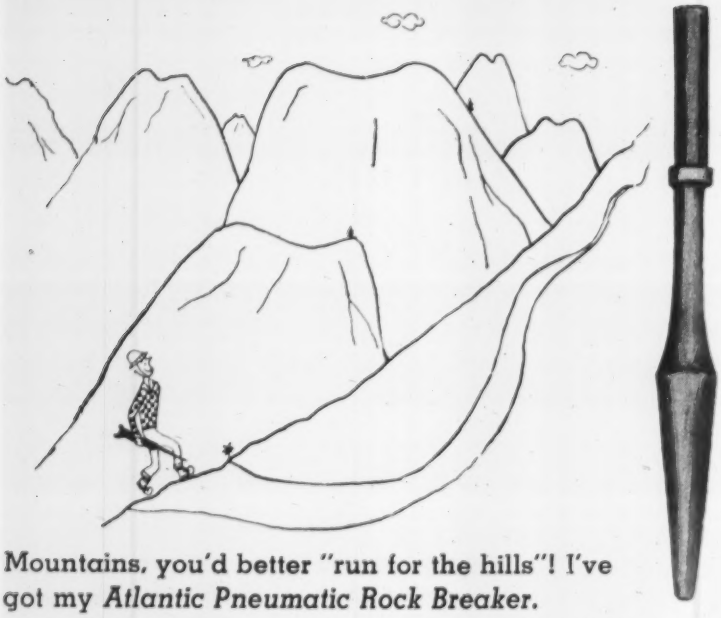
MILES PER HOUR		1	2
CREEPER SPEEDS	1st		
	2nd		
	3rd		

Permit gearing grader to extra-low-speed work—as in working in rocky soil—without sacrificing power. Operator is not tempted to slip clutch—tire slippage is practically eliminated—shock loads are materially reduced . . . Also advantageous on fine finishing work.

ADAMS



Motor Graders **TraveLoaders** **Pull-Type Graders**



Mountains, you'd better "run for the hills"! I've got my *Atlantic Pneumatic Rock Breaker.*

The Atlantic Pneumatic Rock Breaker breaks rock almost 4½ times faster than the old feather and wedge method! Eliminates slow plug and feather method, explosives, upkeep. Made from specially heat-treated Atlantic Tool Steel. Needs no sharpening, no grinding. Variety of sizes. Fits standard pavement breaking machine. Send for Booklet 1.

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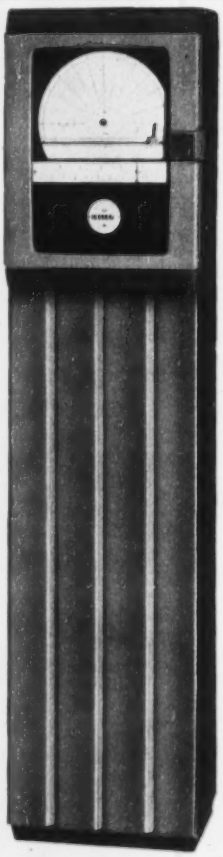

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WHAT you need to know, WHERE you need to know it, with a Sparling Recorder like this! It is the companion to the Sparling Meter on the Main Line and tells instantly, though miles away, what has passed through that main line, shows present rate of flow, and produces clear record of rates of flow—7-day or 24-hour. Other models for up to 60 days!

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DALLAS 1.....726 Reserve Loan Life Bldg.
KANSAS CITY 6, MO.....6 East 11th St.
ATLANTA 3.....66 Luckie St. N.W.
SAN FRANCISCO 24.....85 Industrial St.

voters and construction was started in April, 1953, by Suddreth Const. Co. of Oklahoma City under a $717,053-contract.

The largest and most difficult section of the program was installation of 2,512 lin ft of 72-in. and 1,369 ft of 66-in concrete pipe.

• **Sanitary sewerage**—During recent years the Enid sanitary system has been so overloaded that sewage stood in many manholes to a depth of several feet.

A total of 13 miles of sewer was constructed, enabling the city to eliminate two obsolete sewage lift stations with their costly maintenance. One section of sewer consists of 279 ft of 15-in, 9,760 ft of 30-in and 33-in sewer that carries sewage from the abandoned treatment plant (built in 1920) to the new one.

General contractor on the sewer system was the Asplund Const. Co. and the project cost was $622,552.

• **The treatment plant**—The new plant is located on a 19-acre tract on Bogey Creek about a mile east of the city.

It contains a screen chamber, pump room, office laboratory, preaeration, primary and final settling tanks, aeration tanks, a high-pressure gas sphere, sludge digesters and sludge drying beds.

The structures were so designed and constructed as to permit doubling the size of the treatment units with a minimum of effort and expenditure.

Preaeration and flocculation is on a seventy-minute basis, and primary settling units are designed for two hour detention at average flow.

Step aeration is used with normal aeration time of three to four days.

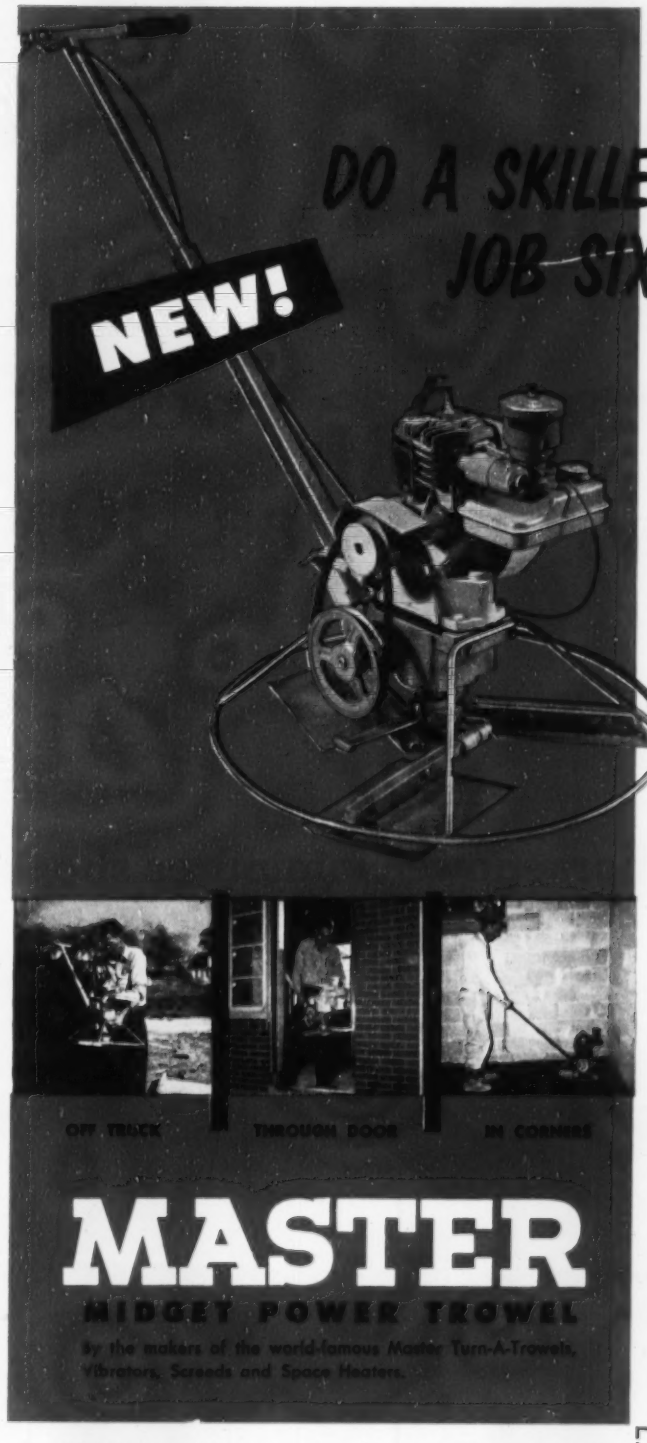
Digesters were designed for 30 days digestion period and 70 days sludge storage during winter months.

Sludge drying beds, 24 sections in all, are 22 ft-6 in. wide by 110 ft long.

All piping in the plant is easily identified through the use of a color code.

Architect-engineers of these projects were Hudgins-Thompson-Ball and Assoc. of Oklahoma City and Taft and Williamson of Enid. As engineering associate, Bernal H. Swab prepared the report, supervised the design and construction of the sanitary sewers and treatment plant. When construction was completed, Swab instructed the operating personnel and placed the plant in operation.

The projects will be under the general supervision of Lance C. DeCory, sanitary engineer for the city.



DO A SKILLED HAND-TROWEL JOB SIX TIMES AS FAST

with a Master Midget Power Trowel

Like all good power tools, the new 24" Master Midget Power Trowel gets more work done faster, with less effort . . . and does a better job.

You're an expert with it in 15 minutes, can make float, sweat, smooth, or hard trowel finishes . . . on slabs, sidewalks, basements, doorways, porches, driveways or small rooms . . . with the same sweep finish that takes years to learn to do by hand.

The concrete sets up better than by hand. The surface is denser, harder and more accurate. You can work with coarser, dryer mixes at the start and waste less time between float and finish. The Master really "pays for itself in no time."

Most important of all, one man with a MASTER can "beat the set-up" on a load of concrete on the hottest, windiest days.

A midwestern contractor reports, "This new trowel is a natural. We can take it everywhere, even on small jobs. It will lick our concrete finishing problems."

Every concrete finisher can do better work and make more money with the 24" Master Midget. You, too.

This is the year to cut your costs. Order a Master Midget today. See your local Master Distributor or write directly to Master Vibrator Company, Dayton.

LIGHTWEIGHT—Weighs less than 70 lbs. COMPACT—Only 24" across; handle telescopes. HAND TROWEL ACTION—Swept-back angle of blades duplicates the skilled sweeping action of an expert finisher. BLADES ADJUST—Set in a second for floating, sweat, smooth or hard trowel finishes. WORKS INTO CORNERS—Finishes right up to pipes, walls, etc. BRIGGS AND STRATTON ENGINE—Famous, dependable 1 h.p. gas engine. PROVED—The Midget is a compact edition of the Master 34" and 48" Turn-A-Trowels—job-proved on tens of thousands of projects.

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Please send folder "Master Midget Power Trowel" showing the details of this time-saving trowel.

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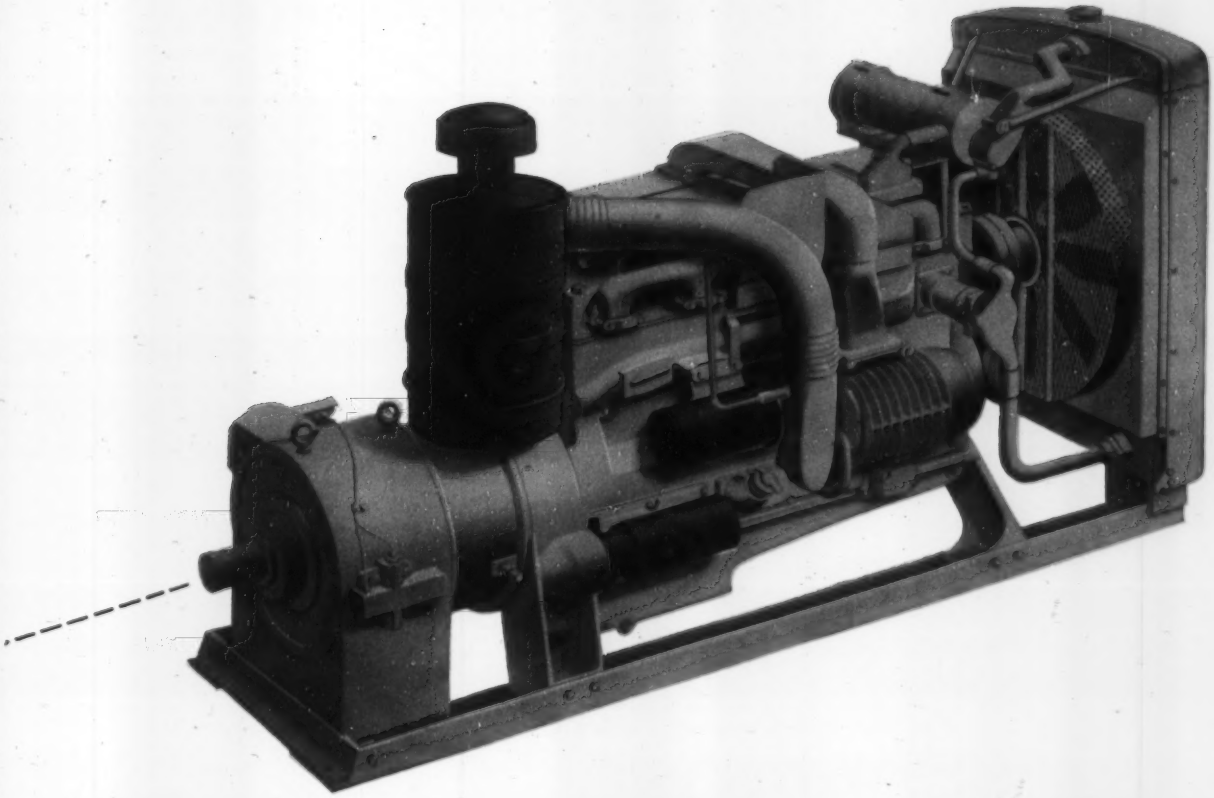
Cummins Diesel - torque converter package speeds work cycle as much as 30%

Gives full utilization of horsepower, minimizes shock



loads, adds to life of shovels, cranes, and draglines

Cummins Torque Converter Packages give smooth steady power over the entire digging or working cycle. Even where digging is the toughest and power requirements fluctuate widely, the Cummins Torque Converter maintains power without lugging, stalling or overspeeding. Crane work, too, can be speeded because loads can be handled more smoothly and accurately.

The output of the Cummins Torque Converter Package is measured by an output shaft governor which determines the exact amount of power required each instant and automatically matches engine speed to load requirements. This increases work capacity, adds to equipment life, saves fuel and engine wear.

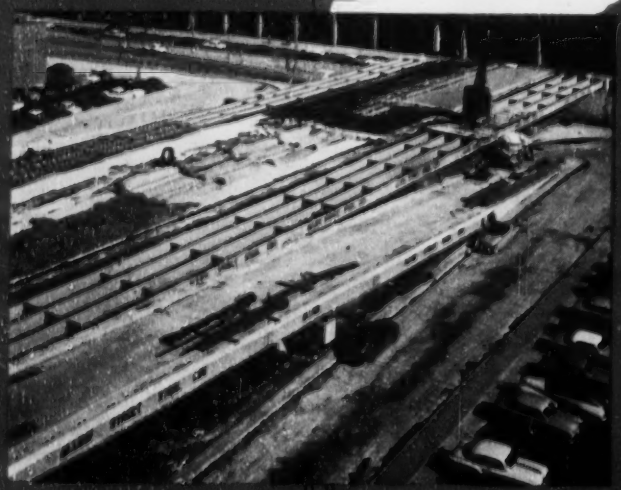
Cummins Diesels, ranging from 60 to 600 h.p., equipped with one of many types of torque converters, can match any job you have. Available as replacement units or in many makes of new equipment.

C208

CUMMINS **Cummins** Engine Company, Inc.
Columbus, Indiana

Rugged diesel power (60-600 h.p.)

An eagle's eye view showing progress on the Congress Street Expressway Chicago Illinois



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SKILL AND FACILITIES

to fabricate and erect the structural steel for super highways, freeways, and bridges of all types

The Congress Street Expressway, Chicago, Ill. Illustrating one of eight sections with a total of 7000 tons. Now under construction by Allied for the Cook County Illinois Highway Department.

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REINFORCED CONCRETE RESERVOIR 118 ft in diameter and 33 ft high presents a polygonal exterior whose facets are flat tie-walls of a series of small concrete arches which form the interior of the hollow reservoir walls.

CONCRETE ARCHES are thin walled.

Unfinished reservoir filled with water to stress hollow arch-wall construction

In France a new method of building reinforced concrete reservoirs involves filling the partially completed structure with water to stress exposed tensile reinforcing in the exterior slab of a hollow arch-wall before finally concreting the structure. The hollow wall of the reservoir is made up of a series of small concrete arches, which face in, tied by flat outside slabs which make the outside reservoir wall look polygonal.

Like segments of cylinders, the small concrete arches forming the inner wall of the reservoir are in compression when the structure is full of water. The flat outside slabs, tying the ends of the arches together, are tension members containing high-strength tensile reinforcing placed annularly.

On a reservoir 118 ft in diameter, holding more than 2,100,000 gallons of water the concrete arch thickness is about 2½ in.

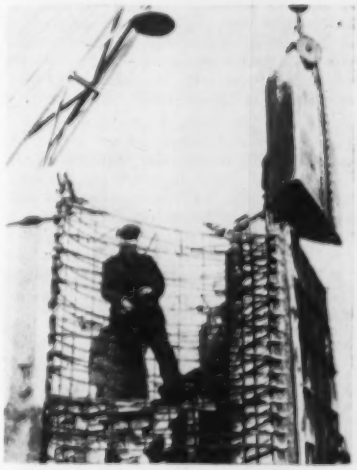
• **Free standing walls**—The reservoir wall, furthermore, is not tied to the rigid floor slab, but is separated from it by a bituminous layer. In large reservoirs the deformations between the wall and the floor are considerably different so that the use of a bituminous separator between wall and floor minimizes the structural uncertainties of secondary stresses at the point where they meet.

First step in forming the reservoir is the placing of the rigid concrete floor. Then the bituminous joint is placed around the edge of the floor and concrete arch forms are placed for the wall.

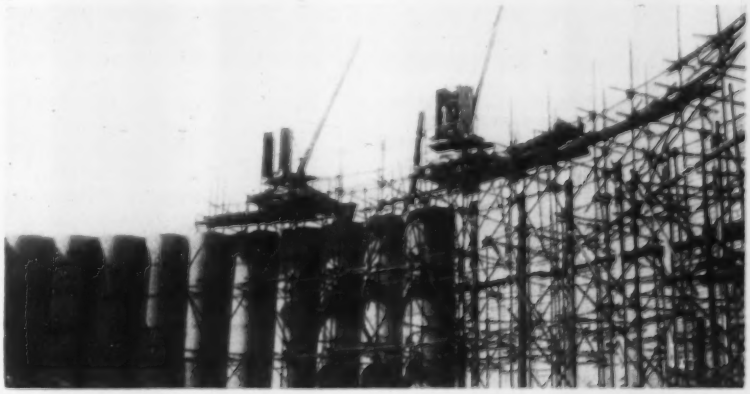
Arches are built up to their final height with the annular reinforcing—tying their edges together—left exposed. When the arches are completed all the way around the reservoir, the structure is filled with water to tension the annular reinforcing. While this high-strength reinforcing is under tension, formwork is placed around it and the flat outside slabs of the concrete wall are placed. Release of the water from the reservoir leaves the outside, or tension, wall prestressed.

• **Standardized formwork**—Formwork for the hollow arch-walls of the reser-

(*Continued on page 62*)



FORMING THE ARCH wall entails use of an inside mold that can be pulled out with a crane after the concrete arch has set.



INSIDE THE RESERVOIR concrete arches are formed before the tie-walls.

NO OTHER PUG MILL MIXER GIVES YOU THIS FEATURE

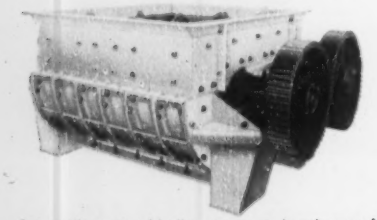
EXTERNALLY REMOVABLE LINER SEGMENTS

Look at the photo above. It shows how easy it is to replace a worn liner segment in the MADSEN Model 440 Twin-Shaft Pug Mill Mixer. It's a one-man operation, completed in the field in a matter of 20 minutes! The worn liner segment together with the liner frame is removed and a new liner support frame and liner segment is inserted in its place from the outside! No need to remove paddle shanks . . . and no need for jacks, crowbars or heavy chain hoists. The liner segments in the MADSEN Model 440 Mixer are precision ground to a width tolerance of .003" plus or minus. They fit perfectly without field modification. The sectional small-piece replacement design permits the user to shift parts to secure the maximum wear factor essential for lowest replacement cost.

★ ★ ★ ★ ★

Based on its performance in all makes of asphalt mixing plants, the MADSEN Twin-Shaft Pug Mill Mixer is considered the outstanding mixer in the industry. Combine this new MADSEN Pug Mill Mixer with the famous MADSEN Asphalt Pressure Injection System (Patented), and you have the right combination for a more profitable asphalt plant operation.

MADSEN *Equipment that Serves* ®



Externally removable liner segments is only one of the years-ahead MADSEN features incorporated in the MADSEN Model 440 Twin-Shaft Pug Mill Mixer. It will pay you to get the complete story . . .
WRITE FOR BULLETIN NO. 400.

MADSEN
Twin Shaft
PUG MILL MIXER

MADSEN IRON WORKS, INC.
14100 E. ROSECRANS AVE., P. O. BOX 38
LA MIRADA, CALIFORNIA

voir has been standardized for use on any reservoir whose diameter is a multiple of .5 meters, since the width of the arch segments of wall is $\pi/2$ meters. The angle between facets of the polygonal exterior of this type of reservoir varies only slightly with increases in diameter: the angle between facets of a 59-ft dia reservoir is 170 deg and that between facets for a 295-ft dia reservoir is 178 deg.

A distinct advantage in this type of reservoir construction is the fact that the annular reinforcing is made up of short straight pieces of reinforcing bar, rather than long curved sections of reinforcing which are more difficult to place and handle.

A comparison of the quantities of concrete and reinforcing steel used in a typical reinforced concrete reservoir and this type of hollow arch-wall reservoir has been worked out by the designers. For a reservoir 118 ft in diameter, with a depth of water of 26 ft 3 in. holding a little more than 2,100,000 gallons of water, the quantities are as follows:

	Typical reinforced concrete	Hollow arch-wall
Cu yd in floor . . .	214,000	137,000
Cu yd in wall . . .	398,000	204,000
Total cu yd	612,000	341,000
Tons of reinforcing steel	65	24.2

Designers of the system are Marcel and Andre Reimbert and the contractor for the reservoir was Le Beton Arme Rationnel, Paris, France.

Huge water distillation plant to boost Bermuda base supply

The largest vapor compression sea water distillation plant in the world is being installed at Kindley Air Force Base in Bermuda.

Four units—each able to produce 2,100 gph of distilled water—comprise the new installation. The total daily capacity of the plant will be 200,000 gal.

Nearly every component part of the unit is approximately twice the size of its largest counterpart built previously for the same purpose. For example: evaporators are 16½ ft high, weigh 23,000 lb. The bronze plates forming them are so heavy that they had to be positioned with cranes and hoists during fabrication.

Bermuda always has been faced with a shortage of fresh water. Residents have solved this problem partially by installing roof catchments that drain into storage tanks. But this supply still must be augmented by water purchased from the mainland and brought to the island by boat.

This household system was not feasible for the air base. Field runways had been used as catchments in some cases, but the situation was plagued by contamination and dependence upon a limited supply of irregular rainfall.

What Air Force officials sought was a large, dependable water supply—and an economy guarantee of 300 lb of distilled water per pound of fuel.

Cleaver-Brooks (the Milwaukee, Wis., company installing the plant) says their unit uses as little as one-tenth of the amount of fuel required by a multi-effect conventional steam still.

Red countries won't bid; but will undercut lowest bid

A number of Eastern European countries (their names have not been made public) have offered to carry out any project for Egypt at a cost of 10% less than the lowest international bid.

These countries reportedly have told the Egyptian government that projects can be submitted for various international bids. Then when prices have been quoted, they will do the work for 10% less (than the lowest bid) and give any guarantees required.

International briefs . . .

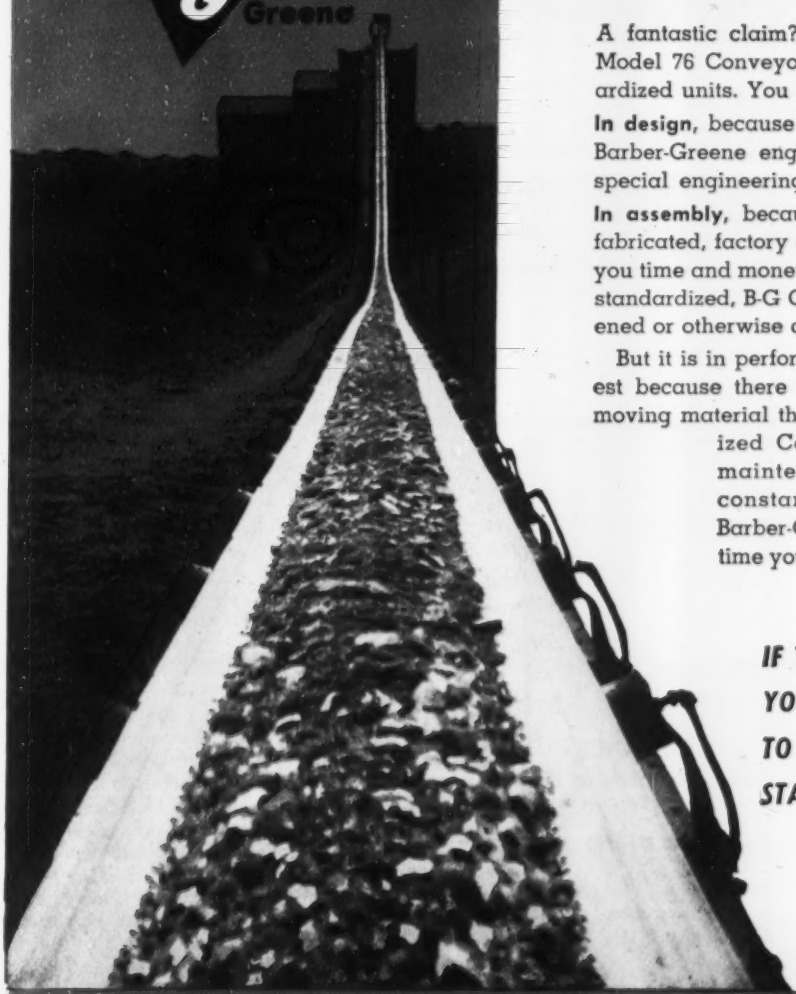
• **Underground TV station**—Britain's first underground television transmitting station—designed to be the most powerful in the world—will be constructed on the grounds of Crystal Palace in London. The station is expected to be in operation by the beginning of 1956. British Broadcasting Corp. already has awarded contracts for excavation of the two-acre site and erection of the underground building shell.

• **Hong Kong tunnel talk**—The Hong Kong Works Dept. has proposed construction of a two-mi tunnel through the Peak of Honk Kong to connect Aberdeen (or Little Hong Kong Valley on the south side of the island) with Victoria. Prompting the proposal: transportation problems arising from industrial expansion and general development of the island. With such a tunnel, an electric tube railway could bring Hong Kong's southern suburban dwellers to Victoria quickly and

(Continued on page 64)

THIS BARBER-GREENE CONVEYOR
BEGAN SAVING MONEY
BEFORE IT WENT TO WORK

Barber BG Greene



A fantastic claim? Not at all. Every Barber-Greene Model 76 Conveyor consists of pre-engineered, standardized units. You save in these important ways:

In design, because all this has already been done by Barber-Greene engineers—you don't need expensive, special engineering.

In assembly, because each component is accurately fabricated, factory aligned and clearly marked to save you time and money in erection. And, being completely standardized, B-G Conveyors can be lengthened, shortened or otherwise altered to meet new conditions.

But it is in performance that your savings are greatest because there is no more economical method of moving material than with a Barber-Greene Standardized Conveyor. Power costs are low—maintenance is minimum—production is constant. Why not take advantage of Barber-Greene's broad experience the next time you have a material handling problem.

IF YOU MOVE MATERIALS IN YOUR BUSINESS, IT WILL PAY YOU TO INVESTIGATE BARBER-GREENE STANDARDIZED CONVEYORS.

WRITE FOR CATALOG

A catalog, completely describing Barber-Greene Pre-engineered, Standardized Conveyors, will be sent on request.

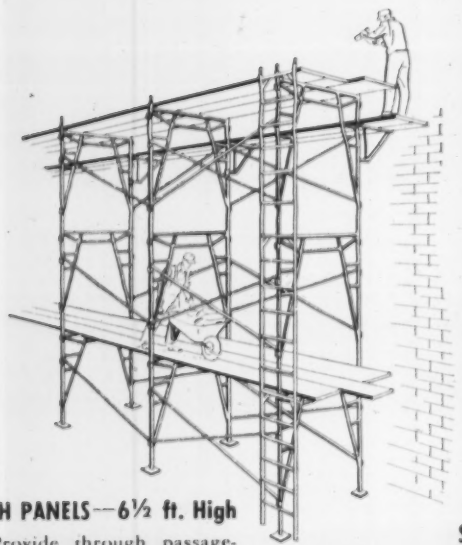
Barber-Greene BG

Aurora, Illinois, U.S.A.

Watch Every Buck . . . *Carefully!*

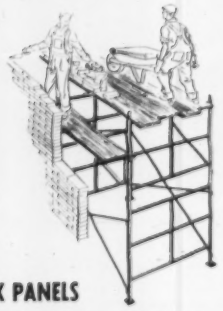
Actually it's not how many bucks you shell out on original costs that count—it's *how much do you save* in erection time and in on-the-job performance. Here are the kind of *savings that count:* can you scaffold higher with fewer panels and parts? can you position plank-bearing brackets at intermediate levels? can you place material at hip-level where your mason can work easier and faster? There's one answer . . . you *can* with Universal Ezebilt Mason Panels, and we don't just make the claim—we show you how in the diagrams below. You'll have a time-saver, a buck-saver and a life-saver with

UNIVERSAL Ezebilt SCAFFOLDING



SH PANELS—6½ ft. High

Provide through passageway at every lift, and rests for plank-bearing brackets at 3' 3", 4' 6" or 6' heights.



SUX PANELS

Provide three plank bearing and bracket rest levels.

SU PANELS

Provide open bay for easy handling of planks and four plank bearing levels.

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UNIVERSAL MANUFACTURING CORP., Zelienople 3, Pa.

cheaply. Estimates on the cost of the project run from $5.5 million up to $7 million.

• **Jungle paper mill**—The first step in Burma's new industrialization program is construction of a bamboo pulp and paper mill (capacity: 100 tons of pulp per day) in a northern jungle area near Akyab. Because of the project's remote location, all supporting chemical industries and an entire community for personnel will be developed at the same time. Two Chicago firms hired to do preliminary engineering—Howard T. Fisher & Associates, Inc., and Robert E. Hattis, Consulting Engineers—already have a survey team at the site.

• **Market plan progress**—The Puerto Rico planning board has approved the first phase of construction for a $21-million metropolitan central market that will occupy an 85-acre site south of San Juan harbor (ENR, March 18, 1954, p. 78). This initial work—a two-year job costing $5.6 million—will involve property acquisition, diversion of the Puerto Nuevo River, and filling and consolidation of land. The second part of the project will include construction of bulkhead bridges, two wharves, transit sheds, transit roads.

• **Municipal services center**—Bogota has hired Skidmore, Owings & Merrill (of New York, Chicago and San Francisco) to work on the pilot plan for a center to house municipal services. The Colombian city's project will include a food storage depot, a milk treatment plant, a terminal for intermunicipal bus lines and a department for special social services.

• **Chemical action**—A combine of five Netherlands firms (salt, oil, coal, steel, sulphuric acid concerns) will start a new soda and allied chemicals industry in the Dutch city of Delfzijl. This site was selected in order to utilize some 20 billion tons of salt deposits near Winschoten. One result of the new venture is already foreseen: Delfzijl's harbor will have to be completely modernized.

• **Record-breaking racetrack**—Milan, Italy, has voted funds for bringing the Monza Autodrome up-to-date—a project that will include rebuilding the ring track with the north and south bends raised to a radius of over 1,000 ft. Modernization will almost double the length of the track tour (to about 6¼ mi) and permit what is reportedly the highest average track speeds in the world—over 190 mph.

WICKWIRE ROPE
A CF&I PRODUCT

Me? Ride to work on wire rope?

That's right. In the course of a year this young lady may travel as much as 150 miles with the aid of wire rope that safely and swiftly whisks her elevator aloft and then just as safely returns it to ground level. It's quite likely that she gets to her job with an assist from Wickwire Rope. Here again—as in so many other fields where wire rope is used—men who manage and maintain the nation's tall buildings have learned to place unbounded faith in the safety and reliability they get from Wickwire Rope.

A YELLOW TRIANGLE ON THE REEL IDENTIFIES WICKWIRE ROPE

THE COLORADO FUEL AND IRON CORPORATION—Abilene (Tex.) • Denver
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1854

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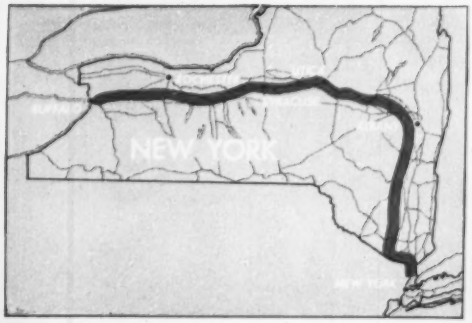
CF&I PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION



By the summer of 1955, you can drive from Buffalo to New York City over the 427-mile New York Thruway. Motorists and truckers are now using about 60 miles of the expressway, which has been called "the greatest highway in the world." Construction schedule is being met by 34 contractors, working for the N. Y. Thruway Authority.

Extra safety—On the four- to six-lane Thruway, inside lanes are one foot wider than outside lanes for safer passing. Contractors using GM Diesel-powered pavers put down 2,000 feet of single-lane concrete daily. *One who switched from gasoline to GM Diesel power saves 66% in fuel costs.*

How GM DIESEL POWER helps build

WORLD'S GREATEST HIGHWAY—

Contractors pushing the great New York Thruway to completion are using General Motors Diesel engines in more different types of equipment than any other Diesel. On big jobs and small, this rugged, yet compact, 2-cycle engine is the world's most widely used Diesel because it gets work done faster and costs less to operate and maintain. Let this great GM Diesel engine prove its superior performance on *your* job—just as it is doing on the New York Thruway!

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DIESEL POWER

. . . available in more than 750 models of equipment built by over 150 manufacturers

Bridging the Hudson—Concrete barge of Construction Aggregates Corp., with GM Diesel-powered crane and compressor, being moved in to pour piers. Three GM Diesel-powered tugs handle 50,000-ton tow against 5-mile tide.

Building grade in Mohawk River Valley, Grandview Construction uses fleet of Euclid trucks with GM Diesel power because of the faster grade climbing ability. GM Diesel engines also power 94 different excavators. *Parts interchangeability for these engines cuts costs.*

Knifing through rock—Battery of four GM Diesel-powered Gyro-Flo compressors used by Geo. M. Brewster & Son supplies up to 2,400 cu. ft. of air per minute, *under steady pressure*, to nine wagon drills working on a tough rock cut near Kingston.

Big push is delivered by fleets of GM Diesel-powered Allis-Chalmers tractors including world's largest crawler, the powerful HD-20, which moves biggest pay loads at higher speeds. *GM Diesels start quickly, respond to varying loads faster and have surplus power for extra life.*

According to the architect, Mr. John Hans Graham, a reinforced concrete frame was selected for this new low-cost apartment building for three reasons: *Economy*—This flatplate type of construction proved less expensive than any other kind of structure. *Speed of Erection*—A complete slab was poured on this project every week. *Flexibility*—This construction allows complete freedom in locating intermediate partitions, pipes, ducts, etc.

These are only a few of the many advantages of reinforced concrete. It is inherently firesafe and highly resistant to shock. Materials are readily available from local stocks. On your next job . . . design for reinforced concrete.

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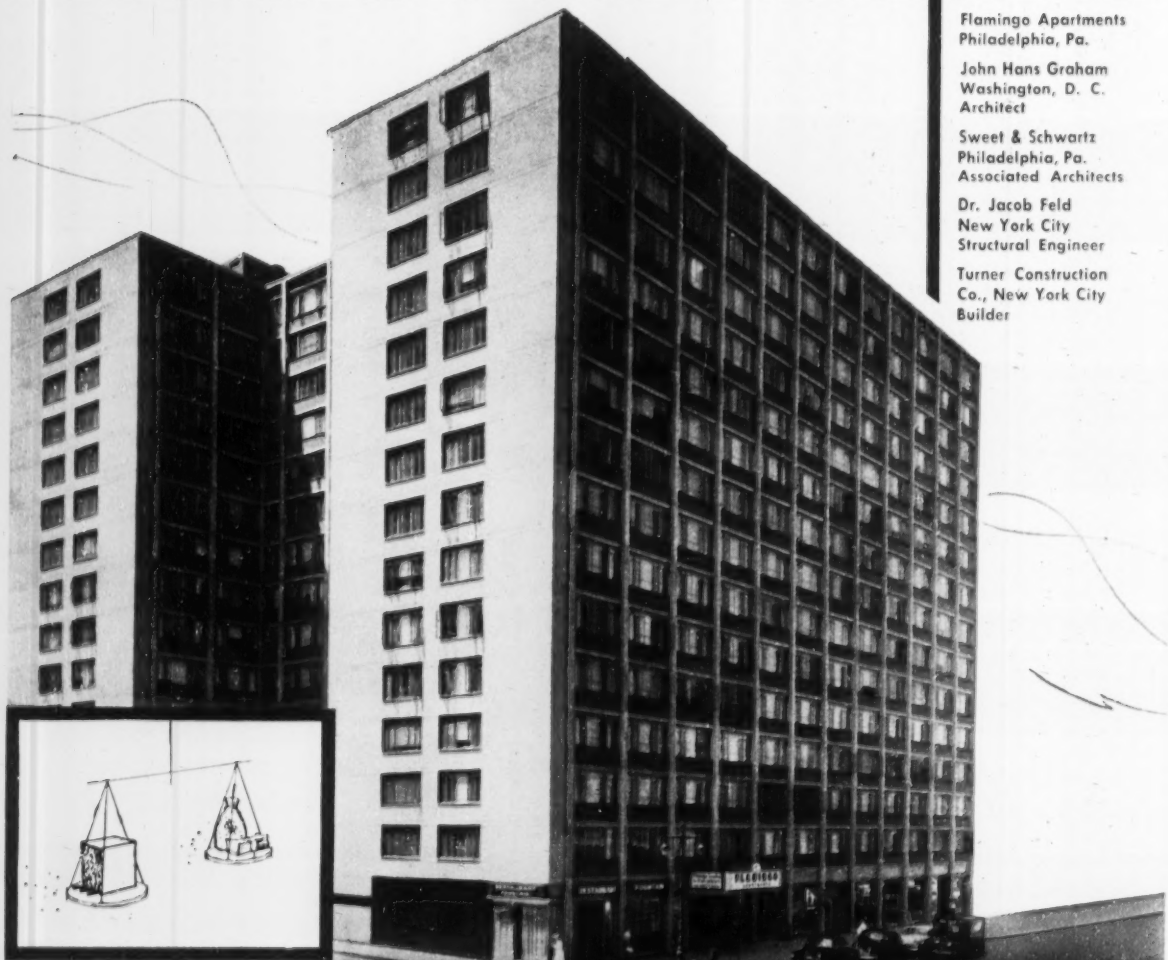
Associated Architects

Dr. Jacob Feld
New York City
Structural Engineer

Turner Construction
Co., New York City
Builder



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MEN AND JOBS

President of the NSPE: C. T. Shoch's new role

Clarence T. Shoch of Allentown, Pa., will be installed as president of the National Society of Professional Engineers during the group's annual meeting in Milwaukee, Wis., this June.

Shoch, an electrical engineer and graduate of the Drexel Institute of Technology, is assistant to the vice-president of the commercial department, Pennsylvania Power & Light Co.

The following engineers have been elected area vice-presidents of the society: Louis F. Frazza, staff manager, transite pipe department, Johns-Manville Sales Corp., Hawthorne, N. J.; M. F. Wooten, Jr., Wooten, Wooten and Crosby, consulting engineers and architects of Charlotte, N. C.; Virgil E. Gunlock, Commissioner of Public Works, Chicago; John B. Jardine, president of the Concrete Sectional Culvert Co. and vice-president-general manager of the Jardine Bridge Co., Inc., Fargo, N. D.; Robert J. Rhinehart, division superintendent, Arkansas Power & Light Co., Pine Bluff, Ark.; Orland C. Mayer, director of industrial development in charge of engineering work, Idaho Power Co., Boise.

Trinity students to build $35,000 research cottage

Forty Trinity University home building students, assisted by the San Antonio (Tex.) Assoc. of Home Builders and local suppliers of materials, have undertaken a major campus instruction project—the $35,000 Home Builders research cottage.

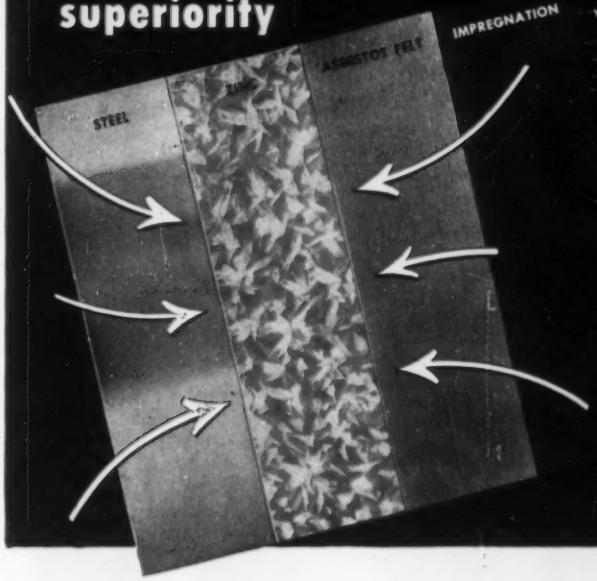
The collegians—37 men and 3 coeds—broke ground recently on the 2,500 sq. ft. cottage, which will be used to train home economic students, to provide a laboratory for home building students, and to demonstrate new home products.

Majors in home building will do the unskilled labor and—under supervision—will work with professional craftsmen in the technical phases of advanced construction. San Antonio suppliers will donate all materials and professional services. The Home Builders Assoc. already has contributed $1,350 to the construction fund.

The Business of Home Building course at Trinity—the nation's first comprehensive academic major in the

(Continued on page 70)

How molten metal helps give Galbestos its superiority



Robertson Galbestos has the greatest resistance to weather and corrosion of any protected steel roofing or siding obtainable anywhere. This position of broad superiority is made possible by a unique manufacturing process exclusive with H. H. Robertson Company.

First, the steel sheet is pickled . . . then given a coating of molten zinc. Asbestos felt is then pressed on so that as the molten metal hardens in cooling it grips the felt fibers in absolute bond. The asbestos is then impregnated with a special asphaltic compound and, finally, given a tough weatherproof coating. Galbestos can be furnished flat or in the 3 well-known corrugations: Standard, Mansard, and V-Beam. The resultant material is so durable, it may be sheared, bent, rolled, crimped and riveted in the field as easily as ordinary unprotected steel. It will withstand the greatest possible extremes in weather temperatures without deterioration, and will actually retard fire better than naked steel. For an industrial roofing or siding that requires no maintenance under the most severe corrosive conditions, specify Galbestos.

Long Service Life. Galbestos will give longer maintenance-free service under the most severe weather and man-made corrosive conditions. Even salt air cannot penetrate its tough coatings to destroy the steel core.

Not Fragile. Galbestos' strong steel core sheet guarantees against breakage—during shipment or during erection.

Resists Climatic Extremes. Galbestos is not subject to damage either by tropic or frigid temperatures. Its coatings will not run under broiling sun or crack or spall in sub-zero weather.

Goes Up Fast. The exclusive Robertson *Top-Speed* method of attaching Galbestos to structural steel speeds up erection for quicker occupancy.

Resists Flame. Leading testing laboratories have made exhaustive tests on the fire resistance of Galbestos and have published the results. Copies of these reports are available for study.

Robertson

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a product of **H. H. Robertson Company**

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Other advantages of this outstanding instrument include coated optics, internal focusing and a ball-bearing race for smooth operation even in sub-zero weather. Check out a White on your next trip and discover how much easier your work can be. Write for DAVID WHITE Bulletin 1053, and name of your nearest dealer. 315 W. Court St., Milwaukee 12, Wis.

Speed all these and many other operations

- finding differences in elevation
- determining grades for building
- laying out lots and foundations
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training of businessmen-builders—began with 24 students in the fall of 1952. Today there are 40 majors.

During summer vacations students are placed in jobs that will further their construction experience. And—in addition to their class-centered work—they make regular field trips to home and industrial building sites, as well as to companies concerned with construction.

AEC announces changes in administrative staff

Several appointments to administrative positions on the staff of the Atomic Energy Commission have been made public.

Edward J. Bloch, director of the division of construction and supply since 1951, has been named director of the production division. Taking over Bloch's old post will be John A. Derry, former assistant director of the production division. William K. Maher, who has been assistant director for construction and engineering in the construction and supply division, will become deputy director of that division.

Colombian government hires Mississippi highway chief

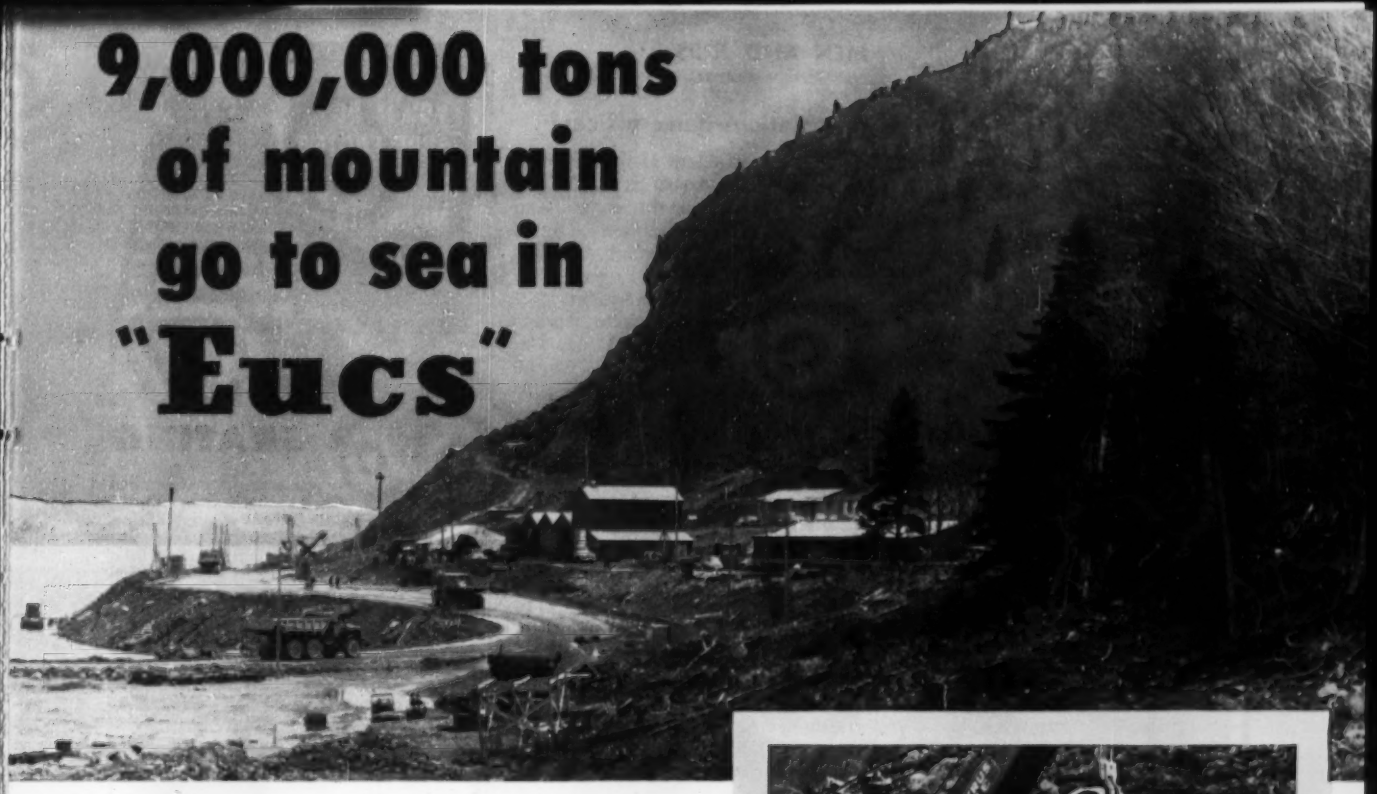
R. A. Harris, chief engineer of the Mississippi State Highway Department since 1934, has resigned to accept a position as provisional advisor in highway maintenance with the Colombian government in Bogota.

Stepping up into the chief engineer post will be Eugene M. Johnson, bridge engineer for the department. He first joined the department in 1933 as a rodman during summer vacation from Georgia Tech. The following year he was hired as an instrument man. In 1942 he went with the district engineers' office in Chicago and Joliet, where he served until his return to the road department in 1947.

Several other personnel shifts have been announced by the department. S. S. Holder, district engineer at Batesville, will be moved to the Jackson office as assistant chief engineer. George Lemon, now district engineer at Hattiesburg, will transfer to Jackson as bridge engineer. Bruce McCaa has been promoted from assistant district engineer to district engineer, at Hattiesburg. Earl Holmes, district engineer at Tupelo, will go to Batesville in the same capacity. Russell Brown, testing engineer at Tupelo, will become district engineer there.

(Continued on page 72)

9,000,000 tons of mountain go to sea in "Eucs"



Canso Causeway in Nova Scotia will join Cape Breton Island with the mainland. About 9 million tons of rock from Porcupine Mountain will form a 4,300 ft. causeway across the Strait of Canso making Cape Breton coal more accessible to the steel plants of Nova Scotia.

Northern Construction Co. and J. W. Stewart Ltd. are using a fleet of twelve 34-ton and two 22-ton Rear-Dump "Eucs" to handle this big tonnage of tough granite. Loaded by 6-cu. yd. shovels on the side of the mountain, the "Eucs" haul their loads a mile or more to the causeway on a 3 shift 'round-the-clock schedule. Euclid dependability has been an important factor in maintaining the fast pace on this huge project.

On big, tough jobs like the Canso Causeway, as well as on more routine construction and mining operations, the advanced engineering and high job availability that's built into every "Euc" pays off for owners in high production and lower costs. For information on Euclids — a complete line of equipment including Rear-Dumps, Bottom-Dumps, Loaders and Scrapers — get in touch with your nearby Euclid distributor soon.

The 34-ton "Eucs" and 6-yd. shovels make an efficient, well balanced team. Every load of rock is weighed before it is dumped on the causeway—less than full capacity loads are few and far between.

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Euclid Equipment

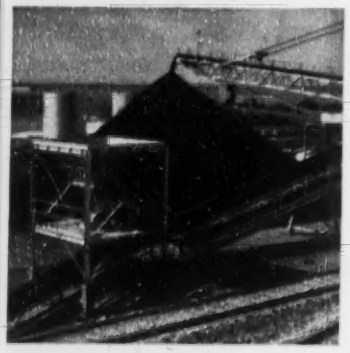
FOR MOVING EARTH, ROCK, COAL AND ORE

GM GENERAL MOTORS

what's NEW in Engineering

A new, fast coupling for simplifying connections of tubing or piping, regardless of the size or purpose, is said to need no threading, flares, ferrules or tools to make the connection. A spring clip is pressed, the tubing is inserted, the spring is released and the connection has been made in one quick operation.

Sticky to dry bauxite in 13 miles and how to handle it effectively at both ends was just one problem facing Kaiser Engineers in developing mining facilities in



Jamaica. Self-heating truck bodies and other specially designed handling methods licked this problem. At the same time, the versatile talents of Kaiser Engineers were focused on all other facilities at the island mine: housing, drying, storage, a 995-foot dock, 13 miles of railroad and a 1,000 ton-per-hour conveyor loading system being just a few of them.

Chemical Business Handbook, just published, is the title of a valuable new book edited by John H. Perry. It is a reference book of modern business management keyed especially to the needs of the chemical and chemical engineering industries.

When it comes to research, preliminary engineering studies, engineering design and layout, estimating, preparation of specifications, construction programming, negotiation of contracts, and procurement and expediting of materials and equipment – call or write: Kaiser Engineers Division of Henry J. Kaiser Company, Kaiser Building, Oakland 12, California.

MEN AND JOBS

Associations name officers

The new president of the American Concrete Pipe Assoc. is A. W. G. Clark, president of the B. C. Concrete Co., Ltd., Vancouver, B. C. Hugh P. Ford, Eugene Concrete Pipe and Products Co., Eugene, Ore., has been named vice-president.

The American Concrete Agricultural Assoc. has elected A. M. Herman, Concrete Conduit Co., Colton, Calif., as president. H. B. Tellyer, of Tellyer Concrete Pipe Co., Albuquerque, N. M., is the new vice-president.

Career briefs . . .

• **Guiding Burma's development**–Edward K. Bryant, principal associate of Knappen-Tippetts-Abbett-McCarthy, New York will head a group giving technical advice to Burma on the feasibility of projects proposed under the country's eight-year, $1.5-billion development plan.

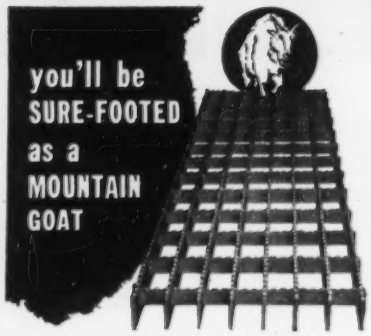
• **Engineering educator retires**–Prof. Ralph B. Wiley, head of Purdue University's school of civil engineering and director of its Joint Highway Research Project, will retire this June. His successor will be Kenneth B. Woods, professor of highway engineering.

• **Planning for Philadelphia**–Architect Paul A. Wilhelm has been named special assistant to Philadelphia's director of commerce. He'll work on industrial land development planning.

• **Golden Gate manager**–On July 1 James Adam will replace retiring James E. Rickets as general manager of the Golden Gate Bridge and Highway District, which administers San Francisco's Golden Gate Bridge. At present Adam is public relations director and legislative representative for the bridge district.

• **Road commission change**–David M. Nichols, Baltimore and Eastern Shore, Md., real estate operator, has resigned as a member of the Maryland State Roads Commission. One of his former business associates–Bramwell Kelly, who was sales manager of David M. Nichols & Co.–has been picked to fill the post.

• **Architect's advancement**–The new chief architectural engineer for Owens-Illinois Glass Co., Toledo, Ohio, is Robert N. Sheley, former head of the firm's construction division at Alton, Ill. He succeeds Walter V. Wuellner, who resigned to establish his own firm.



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Tri-Lok provides you with the perfect open steel flooring for areas where grease, oil and other slippery conditions make walking dangerous.

By serrating both bearing and cross bars, a positive non-slip surface in every direction is assured . . . providing safe walking and eliminating an accident hazard.

Tri-Lok Serrated Grating contains all the advantages of other *Tri-Lok* gratings *PLUS* the non-slip safety feature.

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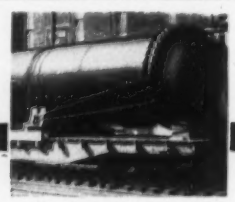

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We also design and fabricate elevated tanks, acid tanks, dye vats, digestors, standpipes, storage tanks, etc. Write for latest Cole catalog—"Tank Talk."

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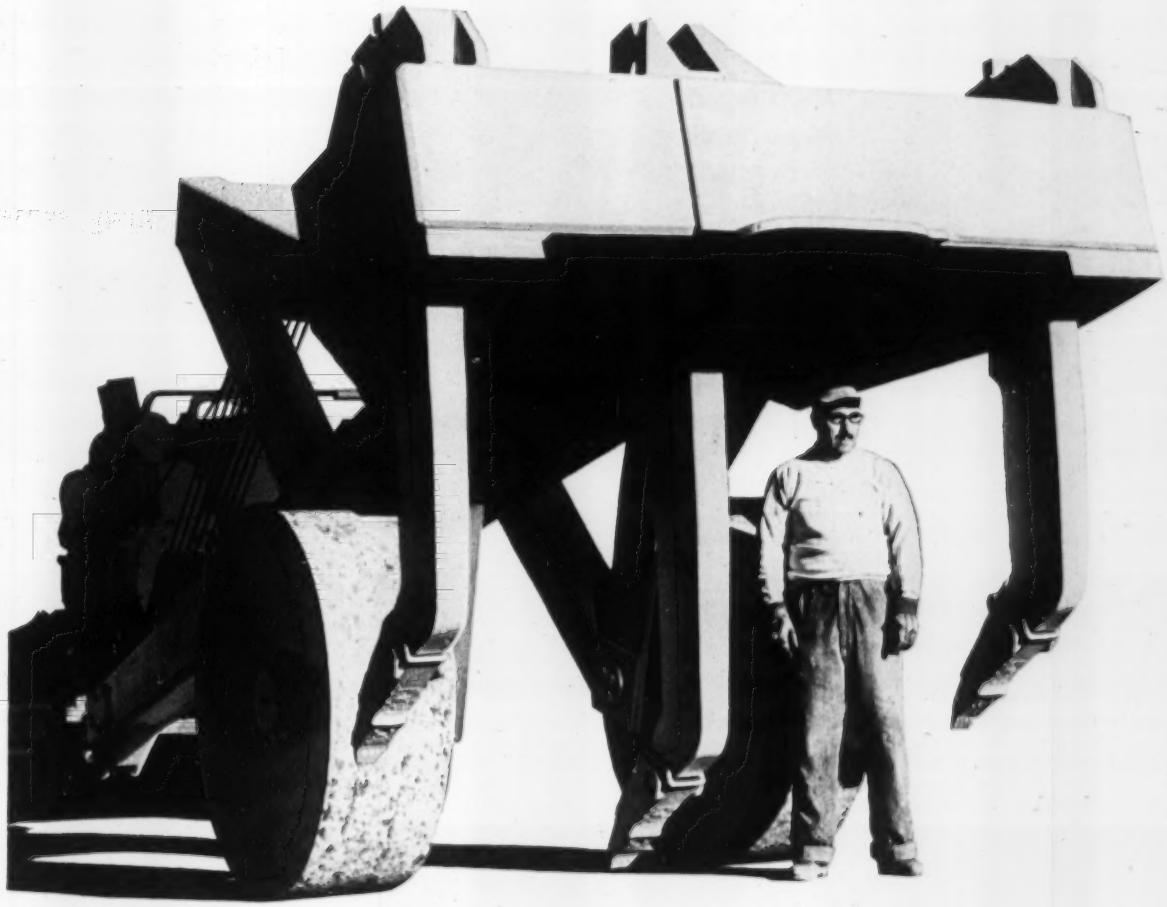
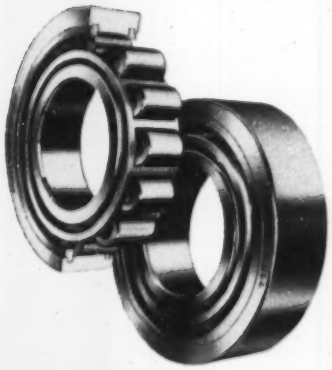




. . . and Hyatt Roller Bearings keep it ready for the road!

In California, construction jobs are like the state: BIG! So Peterson Tractor & Equipment Company, of San Leandro, designed and built this gigantic, seventeen-ton road ripper—strong enough to withstand the pulling effort of *six* of the largest diesel tractors! Naturally, to protect their investment, the builders designed their giant with Hyatt Roller Bearings. Like equipment manufacturers in every industry, they know that Hyatts can be counted on to reduce friction, resist wear, and preserve alignment of moving parts.

HYATT

STRAIGHT BARREL TAPER

ROLLER BEARINGS

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSEY

(*Advertisement*)

Pictures of the month . . . by LeTourneau-Westinghouse . . .

Eliminates stockpile, plant-mix — "Seeding" sand over quarry rock is the primary job of Monarch Cement Company's D Tournapull, Humboldt, Kansas. Unit self-loads river-deposited material, then spreads controlled layers on limestone bank. Process builds up silica content so that pit shovel loads right mixture for cement-making direct into rail cars. Former expensive stockpiling and plant-mix of silica and rock have been eliminated. Besides "seeding" sand, Tournapull also has time to build levee along nearby Grand River. On this job, D Tournapull regularly self-loads, delivers 68 loads (374 bank yards) per 8-hour day.

18-ton haulers turn like pick-ups

"Tournapull Rear-Dumps turn any place my little pick-up truck can," says works engineer for Dawson, Wade & Co, Vancouver. Company has 2 Rear-Dumps on their 2,128,000 yd Trans-Canada Hwy job near Golden, B.C. On 950 ft cycles, each delivers 11 yds every 4.3 min. This includes 2.0 to 3.3 min for shovel-loading.

35 mph over runway — With the concrete runway of Peoria Airport providing an ideal haul road, 4 Tournapulls moved 18,000 yds of topsoil and clay in 12 days (96 hrs) for Swords-McDougal Co of Peoria. Job consisted of building one taxiway 60 x 1,000 ft, another 60 x 2,000 ft, and a parking apron 150 x 285 ft. Hauls ranged from 2500 to 3000 ft one-way.

Clears 1 to 5 acres a day — Clearing river-bottom jungle near Arcadia, Fla, Tournatractor Operator W. E. Miller says his job is, "The roughest I've been on and I've been clearing since 1932. You can't walk through it." Working continually in this very heavy growth, 186 hp Tournatractor cleared 1 to 2 acres a day. In lighter going, it cleared 4 to 5 acres a day.

(*Advertisement*)

. . . with performance reports from around the world

Speed Turnpike Extension — To speed their 7½ mile section of the Pennsylvania Turnpike's Delaware Extension, James D. Morrissey, Inc, Philadelphia, moved 1,600,000 yds of Class 1 dirt with the help of 9 C Tournapulls. Fingertip electric-control of scraper and steer reduced operator fatigue.

Tight squeeze — Filling 11-ft space between buildings, D Tournapull's maneuverability, electric power steer, and short turn radius (12 ft 8 in. at 90°) really pay off. On this job near Los Angeles, 2 "D's" each averaged 4 trips, 28 pay yards hourly on a 5-mile cycle. They moved dirt at ⅓ the cost of shovel and trucks, says Owner Sterling R. Macbeth, Montebello, California.

Easy to operate! — Used by the combine of Petrillo-Healy-Gammino on their Thruway contracts, this Tournatractor clears loading areas . . . also spreads on rock fills. In photo above, note operator's right hand. A finger touch on small lever changes gears instantly through constant-mesh transmission and torque converter. No clutching, no loss of vital momentum.

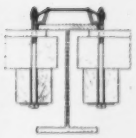
4 major jobs for 1 tractor — 19 mph speeds let Tournatractor handle all dozing jobs on this 90,000 yd conservation dam. Rubber-tired tractor push-loads 2 C Tournapulls (main photo) . . . slopes muddy banks for irrigation channel (inset) . . . levels rock on fill . . . cleans up around rock shovel. When push-loading, Tournatractor heaps Tournapull with 10 pay yds of sandy clay in 30 seconds. Fast spotting, 8 mph backup reduces "deadhead" time . . . instant gear changes save vital momentum.

Tournapull—Trademark Reg. U.S. Pat. Off. Tournatractor—Trademark Pic-650-G

SUPERIOR ACCESSORIES ON THE BEAM

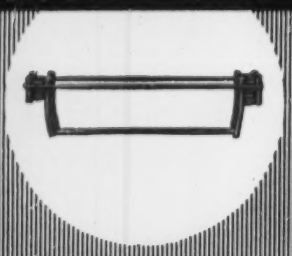
Designed to meet field conditions on BRIDGE SUPERSTRUCTURES, these three types of Hangers provide efficient means for hanging forms from steel beams and girders, not fireproofed.

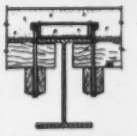
STANDARD COIL HANGER FRAME



When hanging forms where specifications do not permit any hanger wire to be exposed after stripping, use Superior *Standard* Hanger Frames. Detail at left shows their use with double ledgers, ½″ coil bolts, and flat washers. Total safe load on both bolts is 10,000 lbs., or 5,000 lbs. per bolt.

SPECIAL COIL HANGER FRAME



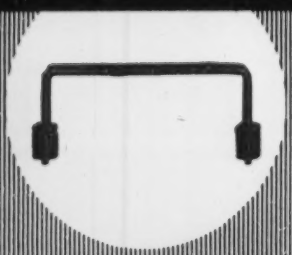


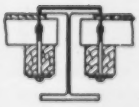
AT LOW HAUNCH

AT HIGH HAUNCH

The design of certain bridge superstructures allows for the permanent deflection of the beams or girders due to the pre-calculated dead load. This deflection is compensated by a concrete haunch on the upper flange, which varies in depth. Superior *Special* Coil Hanger Frames were developed to efficiently meet this field condition, at the same time avoiding any exposed hanger wire. The extent to which the ½″ Coil Bolts are threaded into the coils allows for these varying haunch depths from maximum to zero. (See detail at left.) Total safe load per frame is 10,000 lbs., or 5,000 lbs. per ½″ bolt.

COIL BEAM SADDLE





Superior Coil Beam Saddles are used, as shown at left, where hanger wires may be cut after stripping the forms. The Coil Bolts allow for any variation in lumber and flange thickness and tightening the bolts pulls the forms tightly against the flanges. Forms are easily stripped. Safe load is 6,000 lbs. per saddle, or 3,000 lbs. for each ½″ Coil Bolt. Coil Beam Saddles are also furnished for ¾″ and 1″ bolts.

NOTE: WORKING PARTS (Bolts and Washers) are returnable. Layouts and estimates for Superior Hangers are available without cost or obligation.

SUPERIOR CONCRETE ACCESSORIES, INC.

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New York Office: 1775 Broadway, New York 19, N. Y.

Pacific Coast Plant: 2100 Williams St., San Leandro, Calif.

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OBITUARIES

Harry A. Lutz, 57, project manager for Raymond Concrete Pile Co. of N. Y., died April 15 in Sydney, Australia, where he was constructing a reinforced concrete pier. He joined Raymond in 1927 and had carried out construction in North and South America, Africa and Australia. For three years during the 2nd World War he supervised construction in the Hawaiian area for Contractors, Pacific Naval Air Bases.

Vivian T. Bartram, 74, a retired railway and harbor contractor and president of the Bartram Construction Co. Ltd of Canada, died April 7 in Ottawa, Ont. He supervised the construction of many large harbors bridges and roads in Canada.

Charles B. Lantaff, 74, a retired civil engineer, died April 15 in Buffalo, N. Y. He had been a concrete construction specialist with the U. S. Corps of Engineers for 12 years.

T. Elmer Transeau, 63, director of the Pennsylvania Bureau of Highway Safety for the last 15 years, died at Harrisburg, Pa., April 10. A C.E. graduate of the University of Pennsylvania, he formerly served as traffic engineer for Philadelphia, and was assistant director of public safety there for four years.

Frederick C. Koerner, 70, a New York State civil engineer in Rochester, N. Y., for 40 years, died April 9. Until his retirement last August, he was the testing and materials engineer for the Rochester district office of the State Public Works Department.

Elmer F. Strickler, 61, civil engineer, Sacramento, Calif., died April 6. A graduate of Iowa State College, from 1912 to 1920 he was chief of party sectionalizing land for the General Land Office in the West. From 1920 till his death he was with the Bureau of Public Roads. Eventually he became supervising engineer for federal aid highway construction.

Edward L. Johnson, 58, a retired civil engineer, died April 11 in Staten Island, N. Y. He was a graduate of Polytechnic Institute of Brooklyn.

William States Lee, Jr., 51, former president of the W. S. Lee Engineering Corp., and the Lee Construction Co., Charlotte, N. C., died April 6 at La Jolla, Calif. He got his civil engi-

(Continued on page 78)

You'll have full information on cost-cutting doors for every need in this new 1954 Kinnear catalog.

It gives you full, up-to-the-minute information on how to save maximum space, cut costs, boost efficiency and get more protection at doorways in old or new buildings. In addition to complete data on Kinnear Steel Rolling Doors — the doors with the famous, *Kinnear-originated* curtain of interlocking steel slats — it tells all about Kinnear Steel Rolling Fire Doors, sectional-type Kinnear RōL-TOP Doors, and the protective Kinnear Steel Rolling Grilles. Write for your FREE copy TODAY!

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Keeps 4 Backfillers Busy

IN OMAHA, NEBRASKA, the Metropolitan Utilities District keeps 4 CLEVELAND Backfillers busy on construction jobs for gas, sewer and water lines.

The photograph shows how easily the Model 80 Backfiller is operated by only one man. It also shows how the 80, traveling parallel to the trench as it works, holds to an absolute minimum any interference with the highway's normal traffic capacity.

The 80 is not only cleanly filling this good sized trench, it is also compacting it simultaneously with its tamper unit, a standard accessory feature of this versatile machine. The results it is obtaining clearly illustrate its ability to backfill fast and efficiently and at the same time do an outstanding job of compacting the fill. Traveling continuously as it performs both these operations, it conserves on manpower and eliminates the need for attendant equipment.

In addition to backfilling and compaction these Model 80's do side crane work of all kinds, such as the handling and installation of cast iron, steel and concrete pipe, valves, etc.

The repeated purchases of these machines by this municipal utilities body are evidence of the Model 80's ability to deliver consistently satisfactory results through consistent, outstanding performance on a wide variety of job types and sizes.

Write for descriptive literature and specifications, or get the full story on CLEVELANDS from your local distributor.

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OBITUARIES

neering degree from Princeton in 1924, and joined his father in the two firms and became president in 1934. One of the large jobs engineered by the W. S. Lee Engineering Corp. was the Beauharnois power development near Montreal, completed in the early 1930's. After discharge from the service after World War II he made his home at Rancho Santa Fe, Calif., and in recent years had been associated with Consolidated Aircrafts Co.

Andre Raymond Marie Nizery, engineer in chief of Ponts et Chausees (Bridges and Highways) of France and director of studies and research of l'Electricite de France, died Feb. 27.

George Hemmerick, 63, former municipal and construction engineer, died April 14 in Toronto, Ont. He began his career as a municipal engineer in western Canada. He was a construction engineer for the Capes Construction Co. in Quebec and then moved to Ontario as field engineer with the Department of Highways.

Robert Lee McVoy, 47, a civil engineer for the New York State Department of Public Works, died in Utica, N. Y., April 9. For 16 years he was a junior civil engineer in safety traffic of District 2, covering 16 counties.

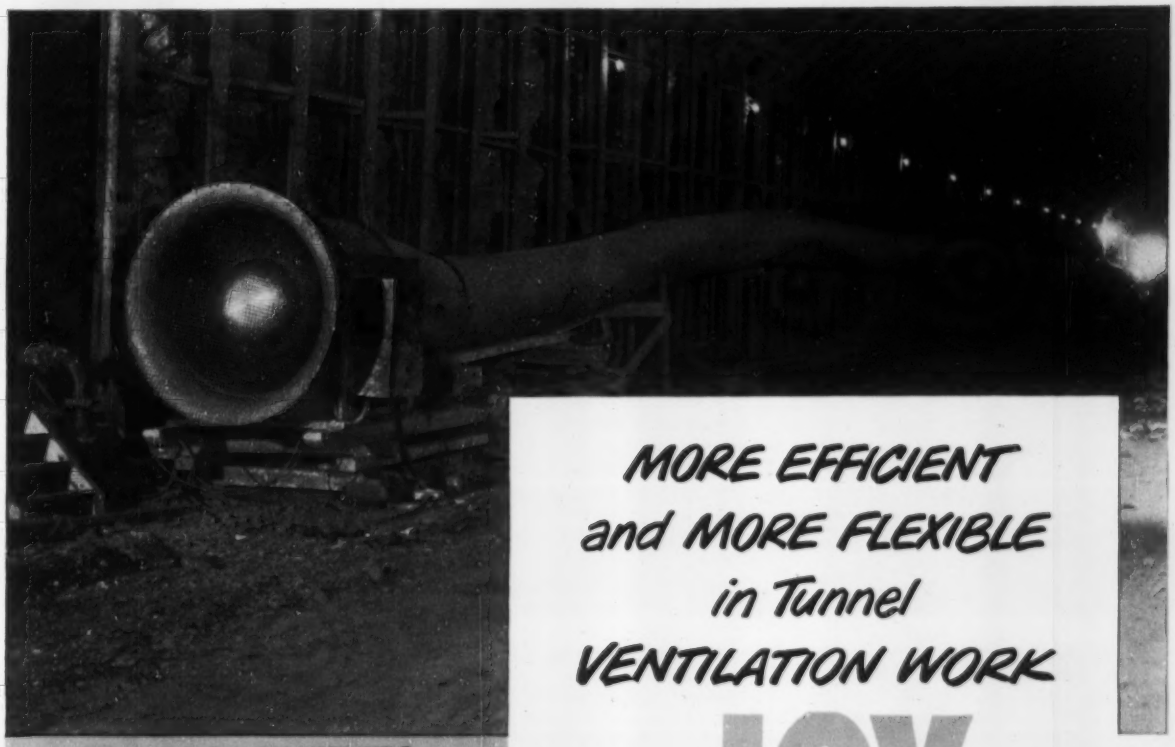
Frazer Matthews, 70, president and general manager of the Ontario Bridge Co. and vice-president of Disher Steel Construction Co. Ltd., died April 11 in Toronto, Ont.

Lars Heimer, 72, long a design engineer with the board of water commissioners at Denver, Colo., died in Pueblo, Colo., April 15.

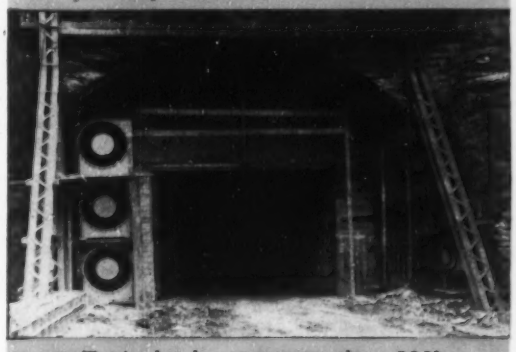
Lake Mead evaporation shows 900,000 acre-ft loss in year

Alternate methods of measuring evaporation have shown, in close agreement, that Lake Mead, on the Colorado River, lost 900,000 acre-feet of water in a recent 12-month period. The loss is equivalent to seven feet of water off the top surface of the reservoir and represents more water than most reservoirs hold when full.

One of the techniques developed by the Navy and the Interior Department for measuring evaporation on Lake Mead keeps an account of all incoming and outgoing heat energy, the difference being that taken up in evaporation. The other method required measurements of the amount of water vapor leaving the reservoir surface.



In this tunnel job, a JOY AXIVANE Fan blows air to the face through lengths of flexible Spiratube.



Typical exhaust set-up—three JOY AXIVANE Fans mounted in the entrance of one of twin bores.

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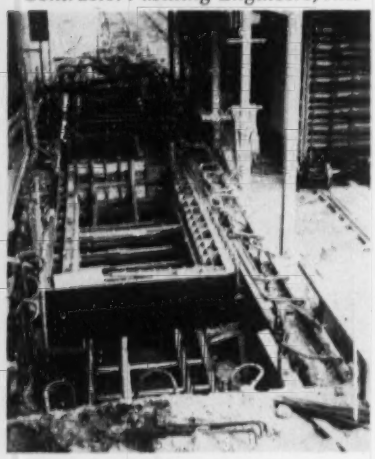

WELLPOINTS RACE TO RESCUE WHEN BOTTOM BOILS

AT 4 FT. above subgrade, the bottom of this excavation began to heave and boil dangerously. A hurry-call went out; by morning Griffin engineers had raced 250 miles to what was clearly a "toughnut" situation—digging at a standstill — hole sheeted on 3 sides — sandwiched between building and siding, with low-ceiling track-shed overhead.

• Lurking below subgrade was the culprit of the case—a layer of quicksand under excess hydrostatic pressure. Fast action was urgent. Within 4 working days, planning, shipping, installing were all completed and the situation under control. Contractors finished a bone-dry job on schedule—with money savings.

• When every hour counts, you can count on Griffin for quick, dependable service.

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BOOKS

For maintenance men

PUBLIC GROUNDS MAINTENANCE HANDBOOK—By H. S. Conover. 495 pp. Tennessee Valley Authority, Old Post Office Bldg., Knoxville, Tenn. $5.00.

A vast amount of information of value to men responsible for the proper maintenance of parks, parkways, highway rights-of-way and public grounds has been assembled in this book compiled by H. S. Conover, landscape architect of the Site Planning Section of the TVA Division of Reservoir Properties. Subjects covered are: Seeding and care of lawns, pastures and borrow pits; planting and care of trees and shrubs; weeds; soil erosion; construction and maintenance of roads and parking areas; materials specifications; and maintenance of picnic areas.

The section on care of lawns, pastures, etc., contains much information that will be of value to highway engineers as it covers the preparation and seeding of slopes. Also it gives complete information on types of grasses to use, including the amount of seed needed for specified areas.

The section on trees and shrubs is complete, including types of trees to use for different situations and very full information on pest control.

Equally complete are the chapters on erosion control and the construction and maintenance of roadways in parks and public grounds.

Professionals in England

PROFESSIONAL PEOPLE—By Roy Lewis and Angus Maude. 284 pp. Phoenix House, London. Obtainable through the British Book Center, 420 W. 45th St., New York 36, N. Y. $4.00 plus postage.

Engineers in this country who are interested in some of the basic issues affecting professional people will find much food for thought in this objective study of professionals in Great Britain, especially what is said concerning engineers and architects. Many of the observations have no direct application here because conditions in England are so different from those under which engineers and architects work in this country. Yet other comments help put our peculiar problems in better perspective.

In a discussion of professional people in business, the authors state: "It is a paradox that the professional man serving industry for a salary is often far less of a business man than the private practitioner . . . Many accountancy and civil engineering practices are in fact run as businesses, conforming to the professional code as regards advertising and ethics, but little distinguishable from other depersonalized, commercial undertakings . . . And a professional man with a keen business instinct is not prevented by the advertising ban from going out and getting custom . . . Professional advertising is a little art of its own—clothes, manner, politics, technical and popular journalism may all play a part in it."

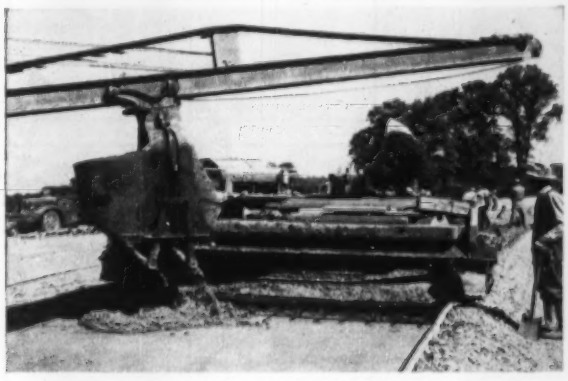
In their concluding chapter on the prospects for the professions, the authors say, in part: "How far private practice can be maintained in professions other than law and medicine is doubtful. The cult of bigness, nationalization and the state employment of so many scientific specialists in teams are all against it. But undoubtedly all professional bodies should become aware of the importance of preserving private practice and promoting the interests of consultants whenever they can. There seems no reason, for example, why professional men and women in positions of responsibility in large organizations should not consistently press the possibility of going 'outside' the organization for professional services whenever possible, rather than trying to create specialized departments."

Miscellaneous notes

• **For sewer design**—A copyrighted work in loose-leaf form, giving charted information on how deeply rigid sewer pipe can be placed in various types of soils, is offered for sale at $6.50 by its author, J. R. Van Buren, of 922 Prince St. S.E., Grand Rapids 7, Mich., calls his 64-page work "Ditch Conduits", and he claims its data are in accord with most recent pipe strength standards of ASTM. Part one gives depths at which sewer pipes can be placed safely in trenches of various widths. There are charts for concrete pipe, standard and extra strength clay pipe, standard and extra strength reinforced-concrete culvert pipe—each in dry cohesionless soil, saturated top soil, wet sand, thoroughly wet clay and saturated clay. Part two covers bedding and cradles, giving coefficients by which depths can be increased when the various types of pipe, bedding or cradles are used. Part three present: formulas, gives information on distribution of superim-

(*Continued on page 84*)

Concrete paving and finishing machines move along the Turnpike Extension, near Fort Washington, Pa. *Contractor*, C. J. Langenfelder and Son, Inc., Baltimore.



First-course pouring at King of Prussia. *Contractor*, George M. Brewster Co., Bogota, N. J.

Two Turnpike field engineers, Ralph Danner, senior mixer inspector, and F. J. Shoemaker, resident engineer, inspect a Bethlehem Dowel Unit immediately prior to pouring at Fort Washington.

360 Miles Without a Stop Light

With the completion of the 33-mile-long Delaware River Extension of the Pennsylvania Turnpike, this "granddaddy" of superhighways will stretch 360 miles across the Commonwealth, enabling motorists to travel from the Delaware River, by-passing the city of Philadelphia, to Pittsburgh and the Ohio border without a single traffic light or cross-road intersection.

The work now in progress will extend the highway east to a point on the Delaware River where a new bridge and highway link will connect with the New Jersey Turnpike, thus forming a limited-access expressway from Metropolitan New York to Pittsburgh and beyond.

The pictures show paving work on the new extension at Fort Washington and King of Prussia, near the present eastern terminus of the highway. Bethlehem, which is well-represented all along the Turnpike, is furnishing dowel units, reinforcing steel, bar mats and other highway steels for the Delaware River Extension.

Inspecting the paving at King of Prussia are F. W. Engelman, resident engineer; Bing Matcher, Turnpike inspector, and Felix Mandato, concrete foreman.

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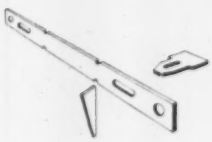
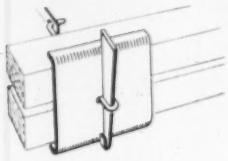
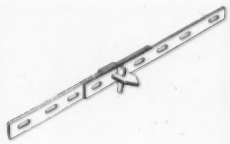
ATLAS COMPO FORMS and ATLAS SPEED FORMS are both available under a number of liberal RENTAL-PURCHASE plans.



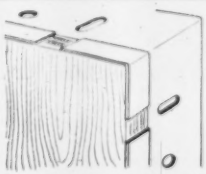
1. Here's the simplest tie system ever developed. Only 3 parts are needed to assemble forms.



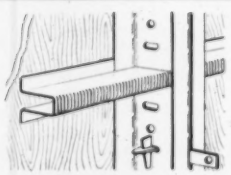
2. Fast action liner clamp hooks to tie.



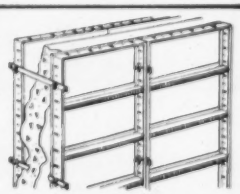
3. A newly designed pilaster tie is adjustable for various size pilasters and re-usable.



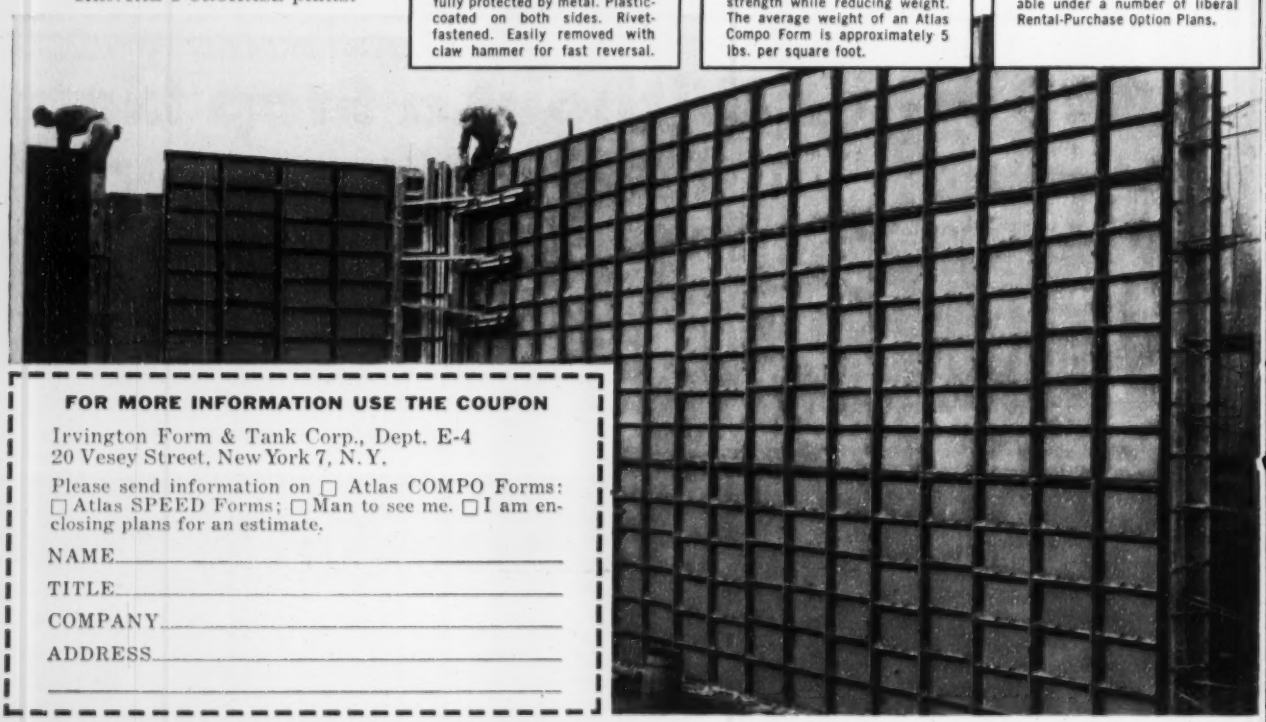
4. Plastic-coated plywood panels are reversible with all edges fully protected by metal. Plastic-coated on both sides. Rivet-fastened. Easily removed with claw hammer for fast reversal.



5. All-steel frames will last indefinitely and provide maximum strength while reducing weight. The average weight of an Atlas Compo Form is approximately 5 lbs. per square foot.



6. Atlas Compo Forms are available under a number of liberal Rental-Purchase Option Plans.



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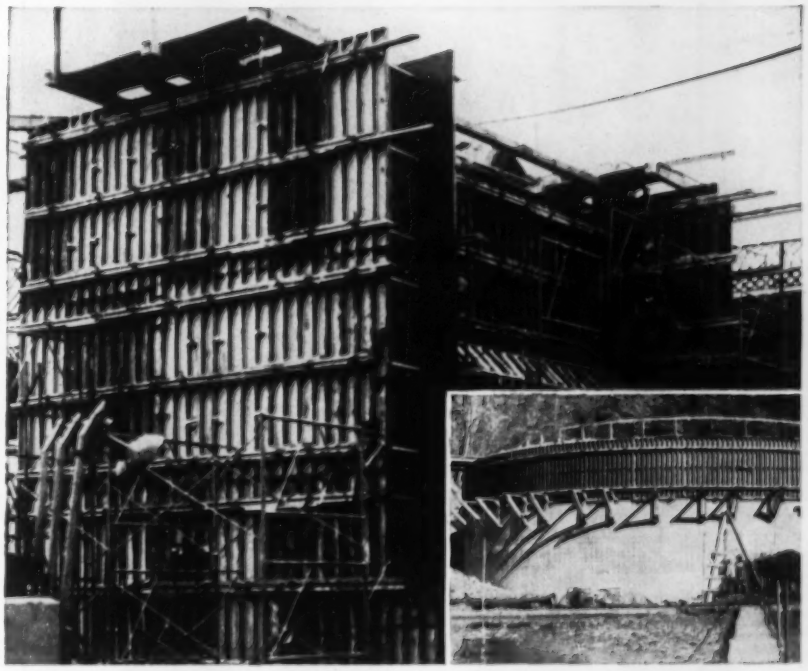

The same Atlas Speed Forms can be used for wall or slab in both circular and rectangular structures.

- *Quick-acting wedge clips permit fast, easy alignment of individual forms.*
- *Large panels can be crane-handled in assemblies, or by hand as individual units.*
- *There is no right or left, and panels are completely reversible. Corners and wale seats are provided. Either wood or steel walers may be used and each form has three punch outs for ties.*
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- *Atlas Speed Forms are available under a number of liberal Rental-Purchase Plans.*

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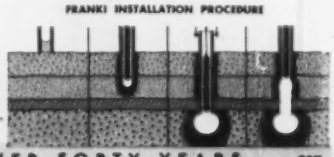

FIRM FOUNDATIONS FOR OVER FORTY YEARS 807

posed loads and tabulates pipe data. All information and charts that are used in this comprehensive work are based on the Marston Formula for ditch conduits.

• **Results of field studies** on the algae of 12 representative sewage oxidation ponds in California have been published by the state's Water Pollution Control Board as Publication No. 7. Investigations–conducted by the Department of Botany, University of California, Berkeley–were made to determine the role played by algae in the purification process. The report discusses the kinds and abundance of algae living in the ponds; geographical and seasonal variation in the composition of algal floral; relationships between environment and the composition of algal flora–and between algal populations and the pond's design, loading, operation and performance. Operational procedures and design features for better pond performance are suggested. Copies of the report may be obtained from the Board at 721 Capital Avenue, Sacramento 14, Calif.

New engineering books

VEGETATION AND WATERSHED MANAGEMENT: An appraisal of Vegetation Management in Relation to Water Supply, Flood Control and Soil Erosion—By E. A. Colman. 412 pp. The Ronald Press, 15 E. 26th St. New York 10. $7.00.

GOOD PAINTING PRACTICE—Vol. 1 Steel Structures Painting Manual. 423 pp. Steel Structures Painting Council, 4400 Fifth Ave. Pittsburg 13, Pa. $6.00.

Reports and pamphlets

HIGHWAY RESEARCH BOARDS Special Reports—No. 12, Research Needed in Geometric Highway Design (75¢); No. 13, Know Your Highway Costs (60¢); No. 14, Structural Effects of Heavy-Duty Trailers on Concrete Pavement (60¢); No. 15, Highway Research Organizations (75¢); No. 15-B, Culvert Hydraulics ($1.05); No. 16, Mechanization of Roadside Operations (60¢); Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

ROADSIDE DEVELOPMENT—1953 Report of the Committee on Roadside Development, Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. $1.35.

BRITTLE FAILURE IN CARBON PLATE STEEL STRUCTURES OTHER THAN SHIPS—Serial No. SSC-65, National Research Council, Washington, D. C.

"Torqmatic Drives Cut Costs"

Heading down a rock-strewn grade with a 40-ton payload at Gavins Point Dam, this bottom-dump "Euc" easily takes the rough going with Allison's TORQMATIC DRIVE transmitting engine power.

Western Contracting Corporation started saving money when the firm put a fleet of TORQMATIC-equipped 27-yard Euclid bottom-dumps to work at Gavins Point Dam. Company officials report:

"Clutch repairs are eliminated in the TORQMATIC-equipped units because there's no clutch pedal for drivers to push. Clutch life averages 90 days in a fleet of direct-drive trucks also working for Western on this job.

"Used to lose as many as 4 drive lines a week with drivers *manually* coordinating engine and drive line on the direct-drive units . . . *never lost a drive line* with TORQMATIC DRIVES."

On TORQMATIC-equipped trucks, drivers quick-shift at full throttle—have only 3 forward speeds (instead of the usual 7 or 10) to handle all loads and grades. The converter-transmission team eliminates gearshift guess and gearbox clash. TORQMATIC DRIVES have such an excellent operating record on this job that the operator intends to specify them in future equipment orders.

If you're one of the men who's changing the face of the earth, do it better and at less cost with Allison TORQMATIC DRIVES in your units. For more information, ask your equipment dealer, manufacturer or write:

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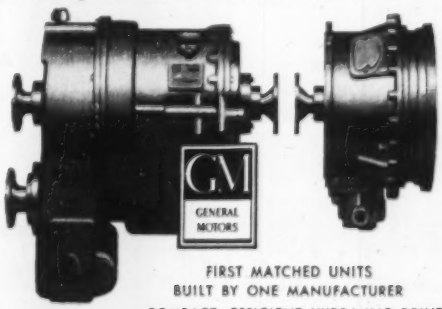
Quick-Shifts at full throttle with finger-tip hydraulic control.

Only torque converter-transmission team designed to work as a unit and built by one manufacturer.

Cuts driver training costs.



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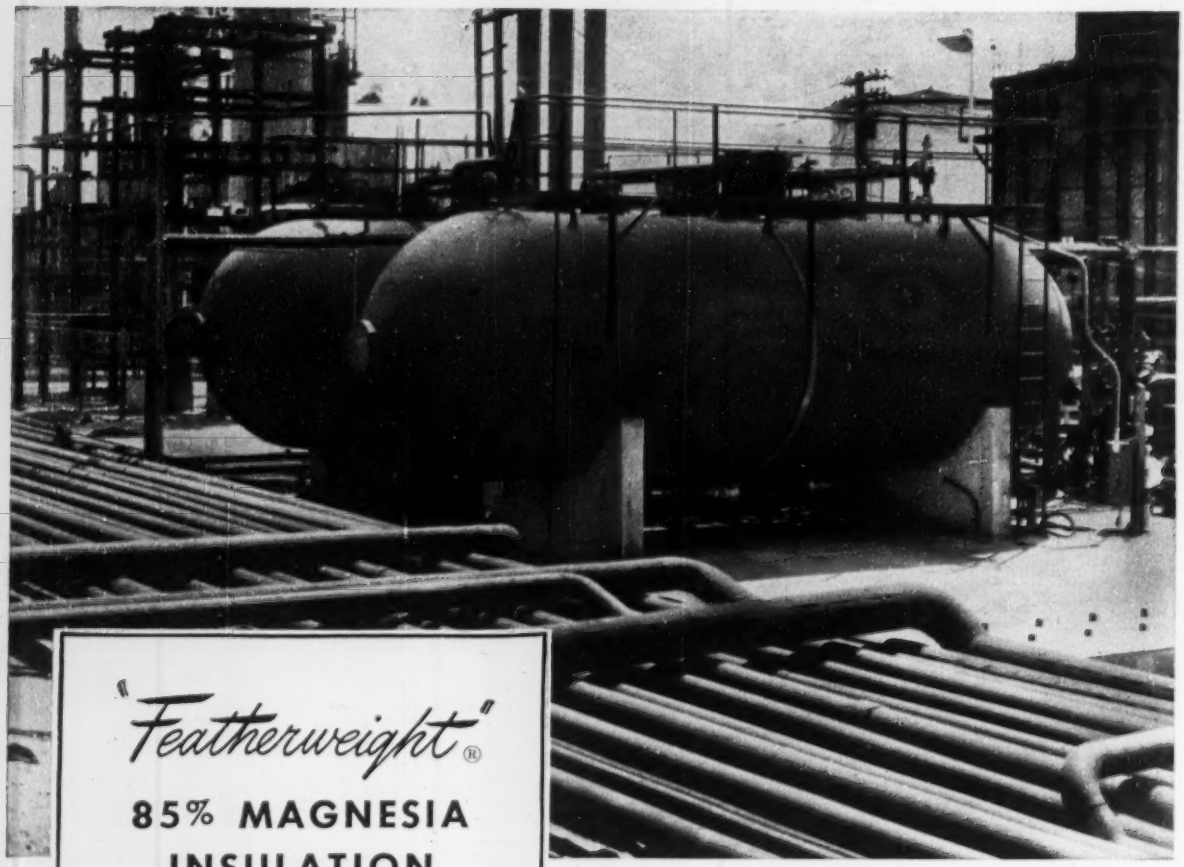

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85% MAGNESIA INSULATION

Desalters and piping in West Texas Refinery, insulated with "Featherweight" 85% Magnesia and covered with weatherproofing materials. Insulation contractor: Willard A. Selle Co., Inc., El Paso, Tex.

helps refinery conserve dollars

"Save heat—save money" is an operating rule that holds true for almost every industry. In the refinery illustrated here, heat is effectively conserved by the use of "Featherweight" 85% Magnesia, used to insulate various pieces of hot piping and equipment.

For any industrial insulation use, "Featherweight" proves to be a thrifty choice. By itself this material (85% basic carbonate of magnesia and asbestos fiber) has an effective insulating range up to 600°F. Used with K&M Hy-Temp Insulation, its range is extended to 1900°F.

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LEGAL

Damages from delays

A contract was entered into with the government whereby the contractor was to construct 100 plane personnel boats. The government was to furnish the motors and other parts. There was considerable delay on the part of the government in furnishing these parts, which delay caused increased cost in performing the contract. The contractor brought an action to recover the damages so sustained and was allowed a recovery.[1]

The court in its opinion stated: "The government denies liability for the extra expense caused by its lateness in delivering the accessories. We think that when it agreed to furnish the engines and gunwale pads to be installed in the boats by the contractor, it agreed to furnish them in time to be installed in the ordinary and economical course of performance of the contract. The government says that it had many other contracts for the construction of similar boats, and that it distributed such engines and gunwale pads as were available fairly among the contractors. It says that its decision as to this distribution was a sovereign act, for which it cannot be held liable as a contractor. See, Froemming Bros. Inc. v. United States, 70 F. Supp. 126, 108 Ct. Cl. 193 and cases there cited. We think the doctrine is not applicable here. So far as appears, the government could, by letting its contracts promptly for the building of the accessories, have had them available on time. There was, so far as we are aware, no general system of priorities which prevented the Navy from acquiring these accessories as rapidly as it had agreed to furnish them. The plaintiff may recover $3,171.03 on his claim for delays caused by the government."

(1) Walsh v. United States, 102 F. Supp. 589.

Waiver of rights

"Waiver is a voluntary relinquishment of some known right, benefit or advantage, which except for such waiver, the party would otherwise have enjoyed. Kennedy v. Manry, 6 Ga. App. 816, 819, 66 S.E. 29. * * * A mere extension of time is not a waiver of known defects where it is done under a promise that the defects will be remedied. Gullett Gin Co. v. Seagraves, 49 Ga. App. 850, 176 S.E. 922. Payment of the full

(*Continued on page 88*)

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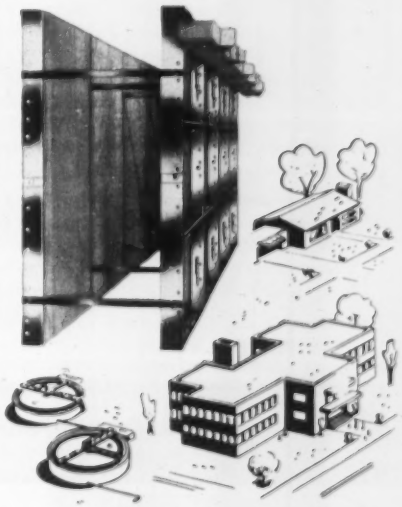

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And because Wisconsin Heavy-Duty Air-Cooled Engines are available in a complete power range from 3 to 36 hp., the equipment builder is offered the greatest power selectivity — engines to fit both the *job* and *the machine* most advantageously.

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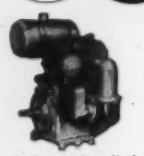
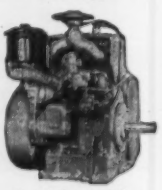


4-cylinder single cylinder 3 to 9 hp.



2-cylinder models 7 to 15 hp.

V-type 4-cylinder 15 to 36 hp.

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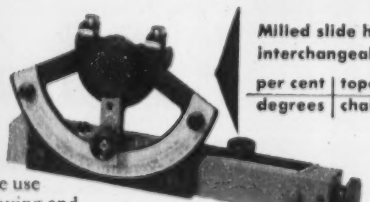

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amount under a contract is not a waiver of known defects where done under an agreement to reimburse the buyer pro rata. Alpharetta Feed & Poultry Co. v. Cocke, 82 Ga. App. 718, 62 S.E. 2d 642. Acceptance of defects does not constitute a waiver where it is done on the understanding that the defects will be remedied. Kendrick v. White, 75 Ga. App. 307, 43 S.E. 2d 285."[1]

The court in its opinion also indicated that the granting of an extension of the time in which to perform the contract so that the parties possibly might arrange a settlement of a dispute did not constitute a waiver of breach of contract where the extension did not result in any detriment to the contractor who had breached the contract or any advantage to the owner.

(1) Gamble v. Hogan, 70 S.E. 2d 658, Court of Appeals of Georgia, July 18, 1953.

Contracts without limit may be terminated at will

"Where the parties to a contract calling for a continuing performance fix no time for its duration and none can be implied from the nature of the contract or from the surrounding circumstances, the contract is terminable at will by either party on reasonable notice to the other."[1] Numerous cases were cited to sustain this principle of law.

In the above case, the defendant, a town, had a contract to furnish water to the other party, who in turn distributed it to nonresident consumers. The contract contained no stipulation as to the duration of the contract. The court held that the town had the right to cancel the contract on reasonable notice.

(1) Fulghum v. Town of Selma, 76 S.E. 2d 368, Supreme Court of North Carolina, June 12, 1953.

Acceptance of work as waiver of defects

The purchaser of a building who had executed a memorandum to the effect that he had examined and inspected the building before he had accepted it and that the work had complied with the plans and specifications and the contract did not waive his right to complain thereafter that defects had developed which were not known or discoverable by the purchaser at the time the inspection of the building was made.[1]

The court also held that if the

(Continued on page 90)

1000 f.p.m. Clyde Hod Hoist speeds construction at 430 Park Avenue

This high speed Clyde Hod Hoist on the 430 Park Avenue job was supplied by the Fordham Hoisting Equipment Co. of New York City.

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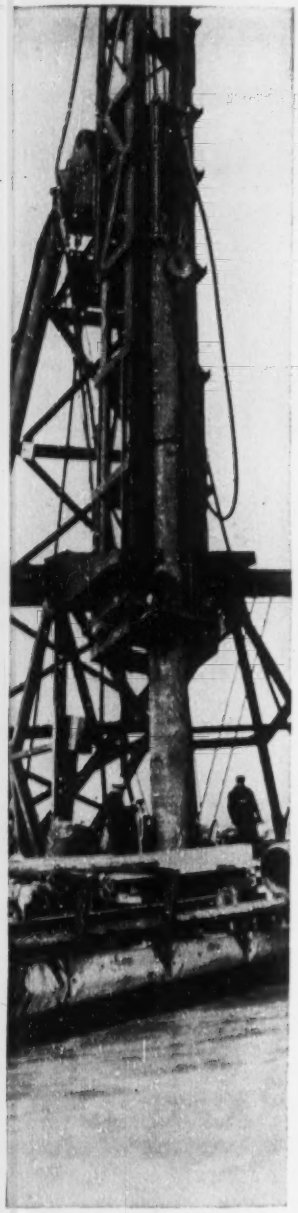

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- **Removable fuel tank**
- **May be suspended or used on ground**

Lamp is painted red, has three red lenses with white borders. Height to top of handle, 19 inches; height of body, 12 inches; width of body, 5-½ inches square; weight, 5 lb. Rugged, 22-ga. steel construction

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purchaser fails to give notice of defects within a reasonable time after he knows or should have known of the defects, then there is a waiver of such defects.

(1) Weinberg et al, v. Wilensky et al., 97 A. 2s 707, 26 N. J. Super. 301, Superior Court of New Jersey, Appellate Division, June 17, 1953.

Mechanic's liens

The general rule is that where there is an unpaid balance under a construction contract, the claim of the owner who expends money to complete the structure following a default of the contractor to complete the same, is superior to that of claims of materialmen and subcontractors.[1]

(1) James Falcone Plumbing & Heating Co. v. Pasquale, 97 A. 2d 720, 26 N. J. Super. 285, Superior Court of New Jersey, Appellate Division, June 15, 1953.

Cost-plus contracts

The court, in a recent case[1] defined cost-plus contracts as follows:

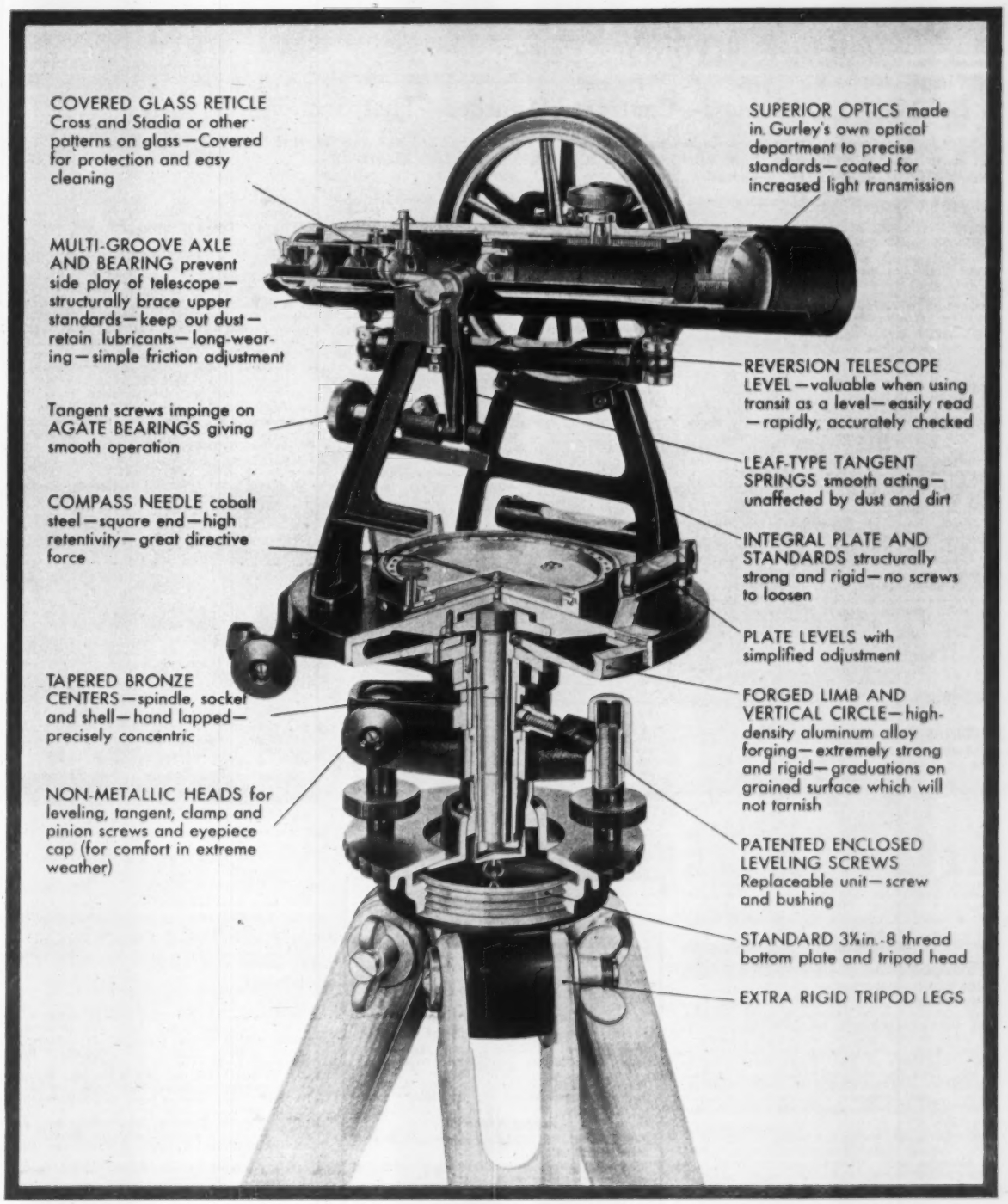
"The independent contractor on a 'cost-plus-a-percentage-of-cost' basis is one who undertakes the construction required by the contract and the owner reimburses him for the costs of materials, labor, etc., and the contractor's profit or gain is to be a certain percentage of the total cost of the project. This type of contractor is legally classified as an independent contractor. * * * The contractor is certainly an independent contractor, if the provisions of the contract make him so and do not in any way indicate or state that the parties intended that it was a contract of employment or agency * * *." (Standard Oil Co. of Louisiana v. Fontenot, 198 La. 644, 4 So. 2d 634).

"A cost-plus contract as generally understood is one where the total cost to the contractor represents the whole payment to be made to him plus a stated percentage of profits. See, A. W. Feeser, Inc. v. American Can Co., D.C., 2 F Supp. 561."

"An authoritative text states the rule as follows: 'In a cost-plus contract, the performing party's profit is limited to the amount specified, and the paying party gets advantage of all profits.' 17 Corpus Juris Secundum, Contracts, Section 10, p. 329."

(1) Grothe v. Erickson, 59 N.W. 2d 368, Supreme Court of Nebraska, June 26, 1953.

(These summaries of court decisions are prepared by J. Vernon Werbin, New York attorney and civil engineer.)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J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

Mass., Fitchburg—B.A. 5/4—City, T. E. Kennedy, supt. Water Dpt., City Hall, storage reservoir dam and spillway constr. pump station, Highway Mare Meadow Reservoir, Westminster, Hubbardston and Princeton. $800,000. Plans deposit $10. Whitman & Howard, 89 Broad St., Boston, engrs. CD 9/29/52.

BIDS ASKED—BUILDINGS

Mass., Hopedale—SCHOOL—B.A. 5/4—Town, Supt. Schools, Hopedale, elementary school, Adin St., former Draper Estates. $400,000. Plans deposit $50. Howard L. Rich & Herman F. Tucker, 45 Newbury St., Boston, Mass., archts. CD 4/20/53.

▲ **Mass., Lowell**—HOUSING—B.A. 5/11—Lowell Housing Auth., J. McPadden, dir., 18 Market St., PHA Proj. 1-3, 372, rein.-con., masonry housing units South Common Village, Gorham St. $1,500,000. Plans deposit $100 refundable. Krokyn & Browne, 184 Boylston St., Boston, archts. CD 6/11/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **John A. Volpe Constr. Co.**, 54 Eastern Ave., Malden, Mass. LB $1,069,145, est. $1,500,000. Air National Guard Facilities, Dow Air Force Base, ENG-19-016-54-91, BANGOR, ME. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Bids Apr. 15. CD 3/23.

▲† **B. Perini & Sons, Inc.**, 73 Montwait Ave., Framingham, Mass. CA $4,907,879, est. $5,000,000. addnl. hardstands aprons, taxiway, exten., maintenance hangar apron, Limestone Air Force Base, ENG-19-016-54-72, LIMESTONE, ME. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. CD 4/12, under LB.

† **Frederick Raff Co.**, 272 Shelton St., Hartford, Conn., LB, $538,187, est. $750,000. booster pump house, exten. high temperature hot water distr. system, Limestone Air Force Base, ENG-19-016-54-90, LIMESTONE, ME. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Bids Apr. 13. CD 3/9.

BUILDINGS

LOW BIDS AND CONTRACTS

Daniel O'Connell's Sons, Inc., 480 Hampden St., Holyoke, Mass., CA, $706,800, Research LABORATORY, Indian Orchard Bldg. 43A, SPRINGFIELD, MASS. Monsanto Chemical Co., 812 Monsanto Ave., Springfield, Mass. Bids Apr. 8. CD 3/31.

New England General Constr. Co., Inc., 341 State St., New Haven, Conn., CA, $579,500, est. $560,000. REGIONAL HIGH SCHOOL No. 6, Barney Hill, GOSHEN, WARREN-MORRIS, CONN. Regional High School District No. 6, Roger Lyman, chn. School Bldg. Comm., Goshen, Conn. Bids Apr. 7. CD 4/13, under LB.

Berkshire Constr. Co., 123 Norman St., Bridgeport, Conn., LB, $499,000, Elementary SCHOOL, Prospect St., NAUGATUCK, CONN. Boro, Tuttle School, Naugatuck, Conn. Bids Apr. 12. CD 3/30.

MIDDLE ATLANTIC

BIDS ASKED—BUILDINGS

▲ **Pa., Nanticoke**—HOSPITAL—B.A. 5/5—General State Auth., 18 and Herr Sts., Harrisburg, general remodeling, elimination of hazards and constr. 3 story wing at Nanticoke State Hospital. $1,000,000. Schmitt & Lippi, 198 N. Main St., Wilkes Barre, archts. A. F. Jones, c/o owner, ch. engr. CD 12/22/52.

▲† **Md., Camp Detrick**—LABORATORY—B.A. 5/22—U. S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C., constr. Laboratory Bldg. MV-2, 3, 4 and 5, Over $5,000,000. Plans deposit $75. Extended date. CD 3/25.

SOON LETS CONTRACT—BUILDINGS

▲ **Pa., Gwynedd Valley**—SCHOOL—At office of Nolen & Swinburne, archts., 1649 N. Broad St., Phila., soon lets contract Elementary and Junior High School, for Academy of The Sisters of Mercy, Gwynedd Valley, $1,000,000.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **McLain Constr. Co.**, 275 Mayville Ave., Kenmore, N. Y. CA $595,741, preservation, enchancement, Niagara Falls, U. S. flank Horseshoe Falls, NEW YORK. U. S. Eng., foot of Bridge St., Buffalo 7, N. Y. Bids Mar. 2. Awarded Apr. 9. CD 3/16, under LB.

▲ **NEW YORK**—Jones Beach State Parkway Auth., Belmont Lake State Park, Babylon,

Lizza & Sons, Inc., 21-23 Orchard St., Oyster Bay, N. Y. CA $1,222,010, Constr. No. M-1, grading, paving, misc. work for Meadowbrook State Parkway from Merrick Rd. Interchange to Jones Beach State Park, Nassau Co. Bids Mar. 23. CD 3/29, under LB.

Anthony P. Miller, Inc., 1333 Arctic Ave., Atlantic City, N. J., CA, $513,287, sewage treatment plant addns., alterations, TRENTON, N. J. Hamilton Twp. Comn., 2090 Greenwood Ave., Trenton, N. J. Myron K. Feld, c/o owner, twp. engr. CD 10/31/46.

PENNSYLVANIA—State Hy. & Bridge Auth., 506 N. Office Bldg., Harrisburg,

Central Pa. Quarry, Stripping & Constr. Co., Hazelton, Pa., LB, $915,493, 23,015 ft. crushed aggreg. base hy. with bit. surf. variable in width, at Turnpike feeder U. S. 30, Brush Creek and E. Providence Twp., Fulton and Bedford Counties. Bids Apr. 15. CD 3/25.

▲ **Thompson Constr. Corp.**, 425 Delaware Ave., Camden, N. J., LB $1,288,194, Queen Lane Raw water pumping station (structures and piping work), PHILA., PA. Dpt. Procurement, City Hall Annex, Phila., Pa., Samuel S. Baxter, c/o owner, Water Comr. Bids Apr. 7. CD 3/15.

MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,

F. B. Asher Jr. & Sons, Inc., 1715 West St., Annapolis, Md. CA $543,849. grading, drainage, surf. 2.715 mi. U. S. Rte. 301, near Waldorf, Contr. CH 257-9-515, Charles Co. CD 1/19, under LB.

† **Allied Contractors, Inc.**, 204 E. Preston St., Baltimore 2, Md. LB $409,940. Nike I control and launching area, Site BA-31-C1, near Fairlee, ENG-18-020-54-37, MARYLAND. U. S. Eng., 24 St. and Maryland Ave., Baltimore, Md. Bids Apr. 14. CD 3/30.

† **Dominion Contractors, Inc.**, 10 E. 23 St., Baltimore, Md. LB $447,892. Nike I control and launching area, near Granite, Eng. 18-020-54-36, MARYLAND. U. S. Eng., 24 St. and Maryland Ave., Baltimore, Md. Bids Apr. 13. CD 3/30.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **E. W. Howell Co.**, 305 Deer Park Ave., Babylon, N. Y., CA, $1,216,856, 100-bed maternity wing, HOSPITAL addn., BAY SHORE, N. Y. Bd. Trustees Southside Hospital, Montauk Hy., Bay Shore, N. Y. CD 12/15/52.

Mahoney Constr. Co., 7714 Ventnor Ave., Margate, N. J., Separate Contracts, $720,000, RESIDENTIAL DEVELOPMENT, MARGATE and LONGPORT, N. J.

▲ **Mahony-Troast Constr. Co.**, 790 Bloomfield Ave., Clifton, N. J., CA, Est. $3,000,000, 9 story Y. M. and Y. W. C. A. Building, Broad and Rector Sts., NEWARK, N. J. Y. M. and Y. W. C. A., 1107 Halsey St., Newark, N. J. Bids Feb. 16. (Correction-contractors address) CD 4/12, under CA

Broomall Builders, Inc., 617 S. 52 St., Phila., Pa., Separate Contracts, $756,000. RESIDENTIAL DEVELOPMENT, Ridley Parkview Development, FOLSOM, PA.

▲ **C. C. Davis Constr. Co.**, Rear 220 Bridge St., New Cumberland, Pa., LB, $1,235,450, general contract

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply	**Latin America**
Sewers, Waste Disposal	**Public Buildings**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	**Federal Government**
▲	**Project of $1,000,000 or over.**
B.A.	**Bids Asked**
ENR	**Engineering News-Record**
CD	**Engineering News-Record Construction Daily**

county PRISON bldg. 27 St. and Route 422 at site of county home, HARRISBURG, PA. Dauphin Co. Comn., Courthouse, Harrisburg, Pa. Bids Apr. 14. CD 3/15.

▲ **Crafton Village, Inc.**, c/o Henry Spiegel, Western Saving Fund Bldg., Phila., Pa., Separate Contracts. $9,000,000. RESIDENTIAL DEVELOPMENT, Street Rd. and Lincoln Hy., LANGHORNE, PA.

Foley & McManus, Inc., Township Line and Treaty Rd., Drexel Hill, Pa., CA. $450,000. BOWLING ALLEYS, three STORES, swimming pool, LEVITTOWN, PA. Pennsburg Sports Center, Inc., 1059 Pontiac Rd., Drexel Hill, Pa.

John M. Zerbey & Son, 1373 York Rd., Abington, Pa. Separate Contracts. $500,000. RESIDENTIAL DEVELOPMENT near Blythwood Braewood Tract, NEW BRITAIN, PA.

Radmont, Inc., 5141 Chestnut St., Phila., Pa., Separate Contracts. $475,000. RESIDENTIAL DEVELOPMENT, West Chester-Paoli Pike, PAOLI, PA.

▲† **Malan Constr. Corp.**, 25-09 42 Road, Long Island City 1, N. Y., LB, $3,480,000, Building No. 633 addn., Naval Boiler and Turbine LABORATORY NOY 74547, Spec. 35564, PHILA., PA. Dpt. Navy, Phila. Naval Base, Phila., Pa. Bids Apr. 13. CD 4/2.

▲ **Woodhaven Somerton Corp.**, Rydal, Pa., Separate Contracts. $4,930,000. RESIDENTIAL DEVELOPMENT, Old Ford Rd., etc., RYDAL, PA.

Joseph L. Marciano, 9127 West Chester Pike, Upper Darby, Pa., Separate Contracts. $400,000. RESIDENTIAL DEVELOPMENT, UPPER DARBY, PA.

▲ **O'Driscoll Constr. Co.**, Wire Bldg., Wash., D. C. LB, $1,989,250. Sect. 2 HOUSING, Proj. D. C. I-18 East Capitol Dwellings, East Capitol and 58 Sts. S. E., WASH., D. C. National Capitol Housing Auth., 1729 New York Ave. N. W., Wash., D. C. Bids Apr. 15. CD 3/16.

Spano Building Co., 221 State Rd., Drexel Hill, Pa., Separate Contracts, $840,000, RESIDENTIAL DEVELOPMENT, 4 and Court Sts., CLAYMONT, DEL.

▲ **S & S Builders, Inc.**, Att. William F. Dewson, New Castle Ave., Rosehill, Wilmington, Del., Separate Contracts, $1,750,000, RESIDENTIAL DEVELOPMENT, Caulkland Rd., WILMINGTON, DEL.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

▲† **Virginia**—B.A. About 6/15—U. S. Eng., foot of Front St., Norfolk, 6 mi. levees and other work for Craney Island Disposal area at Hampton Roads. Total est. $8,000,000. CD 7/31.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Ky., Louisville**—B.A. 5/10—Louisville Water Co., S. Third St., coagulating basin rein.-con. on site of Old Cresent Hill Swimming Pool, $2,000,000, Alvord, Burdick & Howson, 20 N. Wacker Dr., Chicago, Ill., consult. engrs. CD 2/9.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **M. T. Broyhill & Son**, 4264 Lee Hy., Arlington, Va. Owner Builds. $6,500,000. 1,070 unit APARTMENT project, Shirley Hy. and Glebe Rd., ARLINGTON, VA. Corning & Moore, 1726 M St. N. W., Wash., D. C., archts. CD 12/17.

▲ **Durrett Constr. Co.**, Box 388 D Hey Rd., Richmond, Va. Owner Builds. Approx. $1,500,000. one hundred and fifty 1 story, masonry frame RESIDENCES, RICHMOND, VA.

▲ **B. O. Williams**, Ridge Rd. and Patterson Ave., Richmond, Va. Owner Builds. Approx. $2,000,000. 200 masonry RESIDENCES, Ridgecrest Development, RICHMOND, VA.

▲ **Daniel Constr. Co.**, 429 N. Main St., Greenville, S. C. CA Approx. $1,000,000. 50,000 sq. ft. textile PLANT, PICKENS, S. C. Pickens Mfg. Co., Pickens, S. C.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Ind., LaPorte**—B.A. 6/15—City, sewage treatment plant, sewer exten. $1,000,000, Chas. Cole & Sons, 220 W. LaSalle St., South Bend, engrs. CD 8/20.

BIDS ASKED—BUILDINGS

▲ **Wis., Milwaukee**—LIBRARY—B.A. 5/20—Bd. Library Trustees, 814 Wisconsin Ave., library alterations and addns. $3,500,000. Plans deposit $125. Grasold-Johnson & Assocs., 734 N. Jefferson St., Zone 2, archts.

▲ **Wis., Milwaukee**—HOUSING—B.A. 6/1—Housing Authority, 408 E. Wells St., Zone 2, 404-unit

(Continued on page 97)

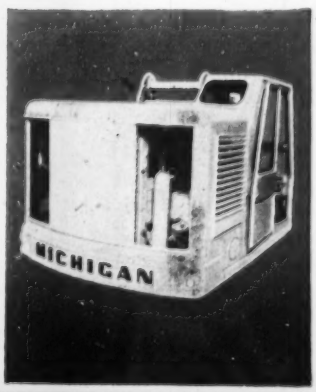
FULL VISION means you'll Move More with a MICHIGAN

Step into a MICHIGAN* cab, and sit in the operator's comfortable seat. Notice how easy it is to follow every move on the job. 3604 square inches of glass!—see what excellent vision is provided, in all directions and overhead.

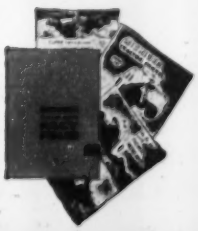
Here, indeed, is a masterpiece of smart modern design: a truly functional cab—fully ventilated, quiet; a comfortable cab designed to make the operator's job as easy as possible. Look, also, at the outside of the cab; at the adjustable louvers on both sides for good ventilation; the sliding rear doors that make it easy to get at the engine; the rear window to complete the full-vision facility.

For an easy point-for-point comparison of the MICHIGAN with other machines, send for the MICHIGAN Fact Folio: contains full information, including an interesting book "More Yardage Through Air Power." The coupon gets prompt action.

**A Trademark of Clark Equipment Company*



CLARK EQUIPMENT



17

CLARK EQUIPMENT COMPANY
Construction Machinery Division
390 Second Street, Benton Harbor, Michigan

Please send the MICHIGAN "24" Fact Folio

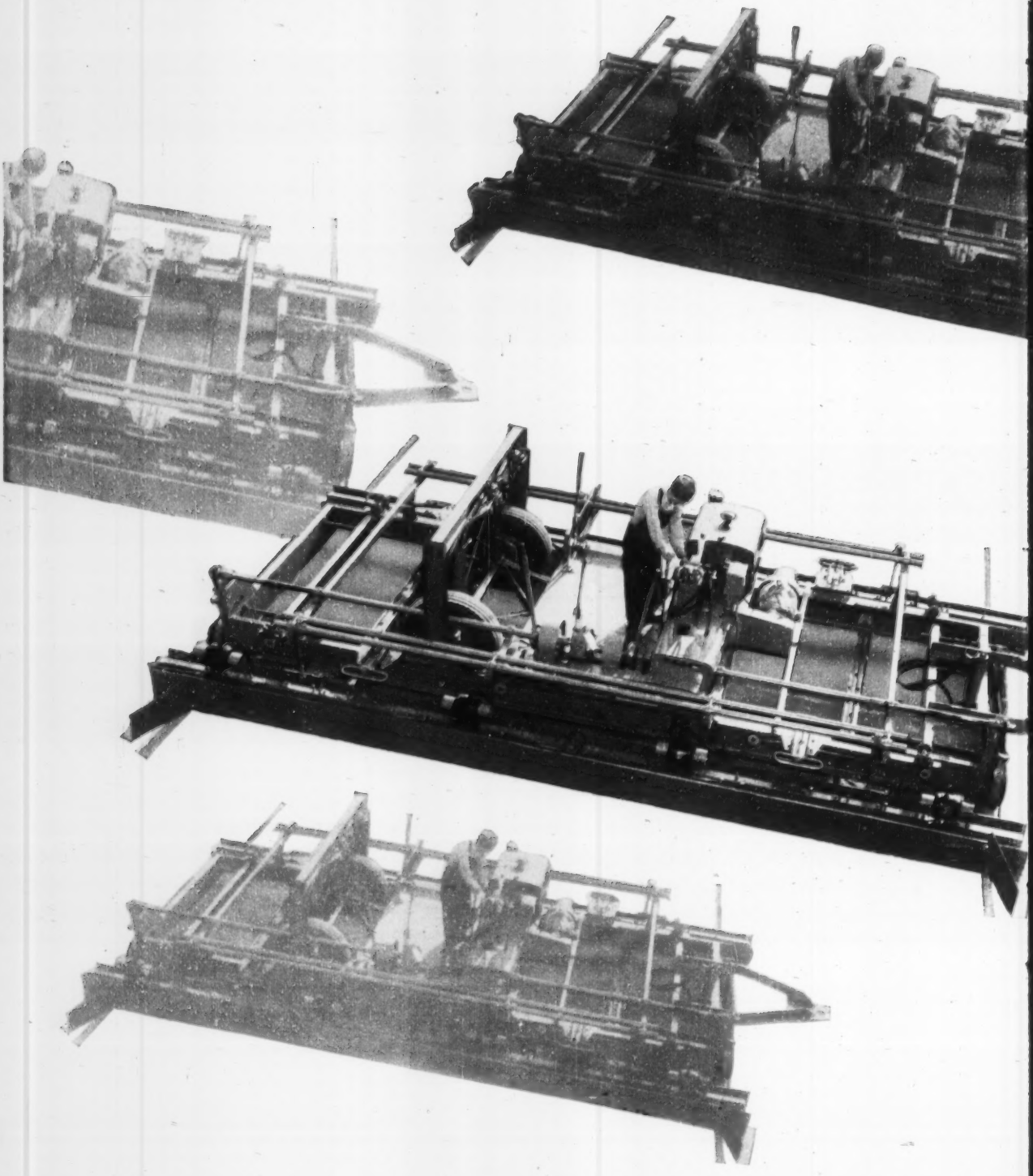
Name_____ Title_____

Firm_____

Address_____

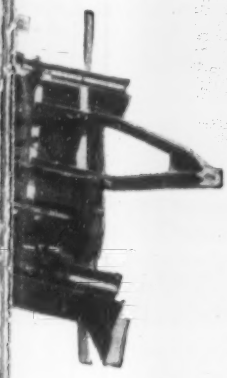
City_____ County_____ State_____

Leading midwest contractor ord



ers fourth Flex-Plane finisher

Repeat orders Boom Sales of versatile Detroit Special



A LEADING Michigan contractor began the year by buying his fourth Flex-Plane Finishing Machine. Repeat order business has always been high at Flex-Plane. In fact, to our knowledge, no contractor who has once used the *Detroit Special* has purchased any other make.

There's a good reason. It's the MOST PORTABLE finishing machine built. It moves *fast* — both on the job and from job to job. Here's where the dollars are saved today, and here's where the Flex-Plane shines. It's the MOST ADJUSTABLE finishing machine built. Famous "Two-in-One" adjustability doubles the range of working widths of other makes. A single Detroit Special can replace two or more less adjustable machines. It does MORE WORK FOR YOU. It's a "do-all" machine that enables contractors to bid all jobs . . . city street, turnpike, airport, water basins . . . and do a real finishing job at greatly reduced costs.

What's more, the Flex-Plane Detroit Special is designed and built to exactly suit the contractor's specific needs. You tell us your special requirements and we'll build a Detroit Special that will cover them.

Compare! Talk to owners using the Special on every kind of work — patch jobs to super highways — the story's the same: *The Detroit Special is by far the world's finest finishing machine!*

GET ALL THE FACTS, NOW! The new, fully illustrated, 16-page factual Bulletin P-111 is just off the press. To get your copy write —

THE FLEXIBLE ROAD JOINT MACHINE CO.
2300 Thomas Road
Warren,
Ohio

Please send additional data on the Detroit Special Finishing Machine.

Name _____

Company _____

Address _____

City _____ State _____

HIGH UP

. . . on the list of "Economy Short-cuts" for the $4 Million Nassau County Sewer Expansion was . . .

FOSTER RENTAL PILING

Hendrickson Bros., Inc.

GENERAL CONTRACTORS
EXCAVATING · GRADING · HEAVY CONSTRUCTION

83 NORTH CENTRAL AVENUE
VALLEY STREAM, N. Y.

L. B. Foster Co.
11 Park Place
New York 7, N. Y.

Re: N. C. Sewage Disposal Plant

Gentlemen:

Because this job was near the ocean, we had to get Interlocking Steel Sheet Piling to hold back mud at subgrades, to assure dry working conditions. Contract requirements made time of utmost importance, so we turned to Foster for prompt delivery of just what we needed. Needless to add, your prompt delivery was taken for granted -- and furthermore we figure that we effected a considerable saving because of your low rental rates.

Yours very truly,

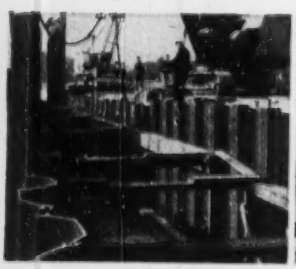
HENDRICKSON BROS., INC.

Arthur J. Hendrickson

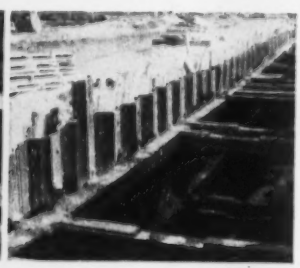
Arthur J. Hendrickson,
President.

1,000 feet of Foster Rental Piling serviced 10,000 feet of this job for Hendrickson Bros. They rented 1,000 ft. to be driven in the relatively soft subsurface a total of ten times—piling being in place a week before pulled for re-use in advanced location. The complex piling requirements were best serviced from Foster's large rental stocks with the exact lengths and the exact sections the job required, at economical low rental rates.

Let us quote you on our low-cost piling rentals—prompt service from five Foster warehouses. Send for Free Piling Brochure illustrating diagrams of all standard-make sections, ask for Bulletin EP-4.



66-inch diameter precast conduit at an average depth of 35 ft.—placed atop a 7-inch concrete slab.



Piling holds back mud for The Sanitary Trunk Sewer conduit which ran 7 miles on Long Island's South Shore.

RAILS—TRACK EQUIPMENT • PIPE • PIPE FABRICATION

L.B. FOSTER CO.

PITTSBURGH 30, PA. • NEW YORK 7, N. Y. • CHICAGO 4, ILL.
HOUSTON 2, TEX. • LOS ANGELES 5, CAL.

(Continued from page 92)

Hillside Terrace Housing addn. $5,500,000. Grassold-Johnson & Assos., 734 N. Jefferson St., Zone 2, archts. CD 2/18.

▲ Ill., Evanston—FACTORY—Bids Asked—City, Inc., 2101 Dempster St., factory addn. $1,000,000.

SOON LETS CONTRACT—BUILDINGS

▲ Ill., Chicago—APARTMENT—Owner, c/o Loewenberg & Loewenberg, archts., 111 W. Monroe St., Zone 3, soon lets contract 105 unit apartment, 2970 Lake Shore Dr., $2,000,000.

Ill., Evanston—BOILER PLANT—St. Francis Hospital, Ridge Ave., soon lets contract boiler plant, $500,000, Gaul & Voosen, 228 W. Superior St., Chicago, Zone 11, archts. CD 3/12.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† Haig M. Boyajohn & Assoc., 990 W. Third Ave., Columbus, O. CA $1,426,359. hangar, warehouse, motor service bldg., heating plant, paint storage bldg., paving roads, and parking areas, Lockbourne Air Force Base, COLUMBUS, O. U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va. CD 4/1, under LB.

▲† Joseph Skilken & Co., 44 E. Broad St., Columbus, O. CA $1,817,972. total base bid plus Alt. 2, est. $2,037,405. Air National Guard facilities incl. steel hangars, brick warehouse, motor service shop, crash truck station, storage bldgs., taxiway, runway paving, SPRINGFIELD, O. U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va. Bids Apr. 8. CD 3/15.

ILLINOIS—State Div. Hys., Centennial Bldg., Springfield,

Madison Constr. Co., Box 222, Edwardsville, Ill., LB, $65,340, reconstr. portions of bridge floor and handrail Illinois River Bridge on Ill. 100, Hardin, Greene and Calhoun Counties;

Allied Structural Steel Co., 20 N. Wacker Dr., Chicago 6, Ill., LB, $90,384. furnishing structural steel for grade separation on Racine Ave. over Congress St. Expressway, Chicago, Cook Co.;

Robt. A. Anderson Co., 4550 Patterson Ave., Chicago 41, Ill., LB, $352,855, substructure, structural steel for grade separation on Racine Ave. over F.A. 131 (Congress St. Expressway) and paved approaches, Chicago, Cook Co.;

P. J. Mahoney Co., R.R. No. 1, Pekin, Ill., LB, $95,190 bridge and approaches; Ill. 87 Tazewell Co.;

H. H. Mass Constr. Co., Huntley Rd., Algonquin, Ill., LB $294,856, substructure, structural steel and paved approaches, for Bridge Ill. 176 McHenry Co. Bids Apr. 15. CD 4/1.

▲ ILLINOIS—State Div. Hys., Centennial Bldg., Springfield,

Peter Baker & Son, 1190 Conway Rd., Lake Forest, Ill., LB, $73,702, bit. surf. 4.56 mi. F.A.S. 103, Lake Co.;

Central Eng. Co., P.O. Box 838, Davenport, Ia., LB, $164,927, c.conc. 1.26 mi. U. S. 67, Rock Island Co.;

Chas. Ind. Co., Point Ave. R.R. 1, Rockford, Ill., LB, $791,447, c.conc. 1.12 mi., c.conc. wid'n. 1.64 mi., bit. resurf. 2.78 mi. Ill. 2, Winnebago Co.;

Crowley-Sheppard Asphalt Co., P.O. Box 144 Maywood, Ill., LB, $254,976, bit. resurf. 8.24 mi. Lincoln Hy., Cook Co.;

Dale Denny Constr. Co., 507 S. Green St., Anna, Ill., LB, $67,048, bit. surf. 2.75 mi. F.A.S. 943, Alexander Co.;

Frank C. Fentz, 901 Tenbroeck St., Paris, Ill., LB, $153,474, bit. resurf. 6.87 mi. U. S. 45 and 0.11 mi. Ill. 13, Saline Co.;

General Paving Co., 30 E. John St., Champaign, Ill., LB $595,618, c.conc. 3 mi. U. S. 45, Champaign Co.;

Giertz-Melahn Asphalt Co., Inc., 57 Douglas Ave., Elgin, Ill., LB, $71,484, bit. 5.82 mi. F.A.S. 35, Kane Co.;

Geo. H. Hartong, Inc., 3401 Sherwood Court, LaGrange Park, Ill., LB, $72,755, bit. resurf. 1.72 mi. S.B.I. 46 Cook Co.;

M. Hoeffken Co. & Hoeffken Bros., Inc., 222 W. B. St., Belleville, Ill., LB, $794,914, c.conc. 6.7 mi. U. S. 66, Montgomery Co.;

Leininger Constr. Co., 30 N. LaSalle St., Chicago 2, Ill., LB, $929,855, c.conc. 7.73 mi. U. S. 66, McLean Co.;

McDougal Hartmann, 1500 N. Adams St., Peoria, Ill., LB, $140,853, grav. on crushed stone 1.34 mi. and 1 bridge F.A.S. 1386, Peoria Co.;

Moore Bros., Inc., 2000 St. Clair Ave., East St. Louis, Ill., LB, $329,989, c. conc.-bit. resurf. 1 mi. and 2 bridges Ill. 159, St. Clair Co.;

J. C. O'Connor & Sons, Inc., 2104 Miner St., Fort Wayne, 6, Ind., LB, $783,338, c. conc. 7.05 mi. U. S. 66, Montgomery Co.;

Payne & Dolan, Inc., 38 S. Dearborn St., Chicago 3, Ill., LB, $122,599, bit. resurf. 3.89 mi. U. S. 66, Logan Co.;

Princeville Stone Co., Princeville, Ill., LB, $151,368. grav. on crushed stone surface course 6.93 mi. F.A.S. 452, Fulton Co.;

Triangle Constr. Co., 480 N. Evergreen Ave., Kankakee, Ill., LB, $371,449, c. conc. base course 0.66 mi., c. conc. base course wid'n. 6.12 mi. and bit. surf. tr. 0.72 mi. U. S. 45, bit. surf. tr. 0.11 mi. Ill. 13, Saline Co.;

J. P. Wetherly Constr. Co., 1016 W. Superior St., Ottawa, Ill., LB, $95,469, bit. surf. 8.05 mi. F.A.S. 271, La Salle Co. Bids Apr. 14. CD 4/1.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ The Mitzel Co., Union Bldg., Cleveland, O. CA Est. $1,000,000. 105,000 sq. ft. masonry bottling PLANT 10 acre site, 4822 E. 49 St., CUYAHOGA HEIGHTS, O. Miller-Becker Co., 6411 Central Ave., Cleveland, O. Louis J. Rotman, 574 E. 260 St., Cleveland, O., archt.

▲ W. B. Gibson & Brothers, Warren, O. CA Est. $10,000,000. SHOPPING CENTER, incl. 100 stores, known as Toledo Town & Country Miracle Glass Mile Shoppers Mart, TOLEDO, O. Don M. Casto Organization, 43 S. Fourth St., Columbus, O. C. Melvin Frank, 43 W. Long St., Columbus, O., archt. L. M. Shaffer, Worthington, O., engr.

▲ Quinn Home Builders, 8046 S. Western St., Chicago, Ill., Own Forces, $2,000,000. 200 HOMES, on south side, CHICAGO, ILL.

▲ Marquette Building Corp., 6283 W. Archer St., Chicago, Ill., Own Forces, $1,000,000. 100 HOMES southwest CHICAGO, ILL. John Bartolomeo, 10836, S. Western St., Chicago, archt.

Lee Newman & Co., 82 Washington St., Chicago 2, Ill. Own Forces. $750,000. 50 HOMES, southwest sect., CHICAGO, ILL.

Jung & Co., 6701 N. Loran Ave., Chicago, Ill. Own Forces. $800,000. 40 HOMES in Cicero-Devon Area, CHICAGO, ILL.

Pearson-Purtell Co., Box 61, Northfield, Ill. Own Forces. $750,000. 30 HOMES, DEERFIELD, ILL.

Wm. E. Schweitzer, 2209 Dodge Ave., Evanston, Ill. LB $628,500. 2 high SCHOOL addns., northeast and southwest sides, HINSDALE, ILL. School Dist. 86, 55 and Grant Sts., Ill. Bids Apr. 5. CD 3/17.

▲ Midland-Lombard Co., 1760 S. Adams St., Chicago, Ill. Own Forces. $2,500,000. 210 HOMES, LOMBARD, ILL. A. J. Del Bianco, 5501 Irving Park Rd., Chicago, Ill., archt.

Hunzinger Constr. Co., 4577 N. 124 St., Milwaukee, Wis. CA Est. $700,000. 2 story, bsmnt., 145x244 ft., rein.-con. cold storage WAREHOUSE, WAUWATOSA, WIS. Mohawk Refrigerator Co., 344 E. Florida St., Milwaukee, 4, Wis. CD 3/17.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

▲† Texas—B.A. 5/14—U. S. Eng., foot of Prytania St., New Orleans 9, La., 8 steel girder railroad bridges with concrete piers, Texarkana Reservoir. $2,000,000-$3,000,000. CD 8/13, under Earthwork, Waterways.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ IOWA—State Hy. Comn., Ames,

Central Constr. Co., Indianola, Ia., CA, $561,804 pavement wid'n., resurf. 9.293 mi. F-56 (4), Henry Co.;

Fred Carlson Co., Decorah, Ia., CA, $822,211 pavement wid'n. 12.341 mi. F-988 (6), Marshall and Tama Counties. Bids Apr. 6. CD 4/13, under LB.

▲ TEXAS—State Hy. Comn., Austin,

Austin Bridge Co., P. O. Box 1590, Dallas, Tex., LB $93,011, reconstr. and widen Navasota River Bridge, 0.096 mi. Hy. ST 6, Proj. F 471 (17), Brazos and Grimes Counties;

Elmer C. Gardner, Inc., P. O. Box 5005, Houston, Tex., LB $1,677,900, 0.925 mi. Trinity River Bridge and incid. grading Hy. SH 73, Proj. FI 1052 (16), Chambers Co.;

Ernest Loyd, P. O. Box 1120, Fort Worth, Tex., LB $73,148, 0.566 mi. concrete bridges and approaches, Hy. ST 97, Proj. C 328-6&7-11&5, Atascosa and McMullen Counties;

L. W. Pelphrey Co., P. O. Box 1166, Gladewater, Tex., LB $67,354, widen bridges and approaches 0.44 mi. Hy. US 80, Proj. C 96-3&4-26&17, Upshur and Gregg Counties. Bids Apr. 14. CD 4/2, 3/30, 3/19.

▲ TEXAS—State Hy. Comn., Austin,

Austin-Worth Constr. Co., P. O. Box 351, Fort Worth, Tex., LB $513,248, b. conc. 13.454 mi. Hy. US 59, Proj. F 458 (3), etc. Panola Co.; LB $244,193, b. conc. 34.469 mi. Hy. SH 26, US 79 and SH 135, Proj. C 138-1-23, C 138-2-9, etc., Gregg and Rusk Counties;

W. L. Barnes, 3102 Perry Lane, Austin, Tex., LB $135,112, grading, structures, base, surf. 15.393 mi. Hy. FM 2028 and 504, Proj. S 1897 (1), etc., McCulloch Co.;

Bell, Braden, Barker & Gilvin, Inc., P. O. Box 2268, Amarillo, Tex., LB $224,194, flexible base, two course surf. tr. 17.53 mi. Hy. US 87 and 287, Proj. C 41-5&7-15&17, Potter Co.;

J. O. Boswell, Lubbock, Tex., LB $72,402, seal coat 78.625 mi. FM 1035, 267, 94, 1056, etc. Proj. C 448-6-2, C 538-2-7, etc., Collingsworth, Knox, Childress, Hall, Cottle, Motley, Hardeman and Foard Counties; LB $103,285, flexible base, three course surf. tr. 10.202 mi. Hy. SH 137, Proj. C 494-1-3, Dawson Co.;

John F. Buckner & Sons, P. O. Box 76, Cleburne, Tex., LB $237,762, flexible base, two course surf. tr. 5.806 mi. Hy. US 180 and SH 67, Proj. C 11-9-19, Stephens Co.;

Cage Bros., 6559 N. San Pedro St., San Antonio, Tex., LB $100,206, seal coat 106.243 mi. Hy. FM 1211, 87, 870, 11, 1216, 1214, etc. Proj. C 479-3-3, C 548-2-4, etc., Koving, Martin, Upton, Pecos, Reeves, Andrews and Winkler Counties; LB $146,903, grading, structures, base, surf. 14.209 mi. Hy. FM 473, Proj. S 547 (2), etc., Kendell Co.;

Cooper & Woodruff, 222 Mays Bldg., Amarillo, Tex., LB $92,242, grading, structures, base, surf. 9.566 mi. Hy. FM 293 and 1342, Proj. S 1039 (4), etc., Carson and Potter Counties;

E. B. Darby & Co., Inc., P. O. Box 467, Pharr, Tex., LB $208,653, asph. level up course and two course surf. tr. 43.001 mi. Hy. US 83, SH 107, Proj. C 39-1-9, etc. Webb, Starr and Hidalgo Counties;

Dew Constr. Co., Inc., P.O. Box 641, Tyler, Tex., LB $129,772, grading, structures, base, surf. 5.261 mi. Hy. FM 1603, Proj. S 1883 (1), Navarro Co.;

Heldenfels Bros., Rockport, Tex., LB $123,777, grading, base and surf. 12.213 mi. Hy. FM 881, Proj. R 507-3-2 and R 507-4-2, San Patricio and Aransas Counties;

O. W. Howard, Madisonville, Tex., LB $162,538, grading, structures 6.018 mi. Hy. SH 110, Proj. S 650 (2), Smith Co.;

The Jarbet Co., Box 5008 Beacon Hill Station, San Antonio, Tex., LB $447,258, flexible base, hot mix b. conc. 6.244 mi. Hy. US 80, Proj. F 235 (18), Howard Co.;

Killian-Keller Co., P.O. Box 393, Fredericksburg, Tex., LB $105,040, select material 3.938 mi. Hy. FM 93, Proj. R 700-4-6, Llano Co.;

Robert Lange, Inc., Brenham, Tex., LB $82,297, flexible base, one course surf. tr. 4.304 mi. Hy. FM 457, Proj. S 1083 (2), Matagorda Co.;

Hugh McMillan, P.O. Box 1227, El Paso, Tex., LB $234,009, wid'n., flexible base, b. conc. 4.587 mi. Hy. US 62 and 180, Proj. C 374-1&2-6&11, El Paso Co.;

McMillen-Burkett Constr. Co., P.O. Box 450, Texarkana, Tex., LB $111,203, grading, structures, base, surf. 5.751 mi. Hy. FM 1996, Proj. S 1581 (1), Bowie Co.;

Menefee Bros., P.O. Box 431, Center, Tex., LB $117,214, grading, structures, base, surf. 4.187 mi. Hy. FM 2081, Proj. R 1949-1-1, Newton Co.;

Moore Bros. Constr. Co., Lufkin, Tex., LB $90,239, grading, structures, base, surf. 7.755 mi. Hy. FM 241, Proj. S 1629 (2), Cherokee Co.;

Holland Page, P.O. Box 1181, Austin, Tex., LB $134,465, grading, structures, base, surf. 5.979 mi. Hy. FM 1456 and 1371, Proj. C 1410-1-3, etc., Austin and Washington Counties;

W. O. Pelphrey, 1412 Electric Bldg., Fort Worth, Tex. LB $614,533, flexible base, and b. conc. 11.184 mi. Hy. US 80, Proj. FI 235 (14), etc., Midland Co.;

M. E. Ruby, San Marcos, Tex., LB $111,034, grading, structures, base, surf. 6.693 mi. Hy. FM 2091, Proj. S 1871, etc., Gonzales Co.;

South Texas Constr. Co., P.O. Box 5056, Corpus Christi, Tex., LB $134,205, flexible base, two course surf. tr. 5.024 mi. Hy. SH 107, Proj. S 64 (4), Hidalgo Co.;

T. R. Vardeman & Son, P.O. Box 485, Nacogdoches, Tex., LB $98,586, grading, base, surf. 10.443 mi. Hy. FM 774, Proj. S 1878 (1), Refugio Co.;

Dean Word Co., P.O. Box 330, New Braunfesl, Tex., LB $495,881, grading, overpass, flexible base, asph. 3.724 mi. Hy. US 81 and SH 218, Proj. FI 31 (15), Bexar Co.

cancelled bids to have been opened Apr. 13, grading, structures, base, surf. 9.21 mi. Hy. FM 1885, Proj. C 649-2-4, R 649-2-5, etc., Parker Co. CD 3/25, 3/19, 4/2, 3/30, 4/1

▲ TEXAS—State Hy. Comn., Austin,

C. C. Booth & Stephen Luce, P.O. Box 508, Stephenville, Tex., LB, $189,807, grading, structures, base and surf. 20.023 mi. Hy. FM 1661, 1263 and 1986. Proj. S 1650 (3) and S 1605 (2), etc., Haskell, Jones, Stonewall and Kent Counties;

John F. Buckner & Sons, P.O. Box 76, Cleburne, Tex., LB, $95,985, grading structures, base and surf. 4.671 mi. Hy. FM 730, Proj. S 1537 (2), Wise Co.;

Cage Bros., 6559 N. San Pedro St., San Antonio, Tex., LB, $197,060. seal coat 226.626 mi. Hy. SH 290, FM 769, US 62, SH 86, etc. Proj. C 130-4-13, C 130-6-5, etc., Hockley, Cochran, Terry, Castro, Swisher, Hale, Crosby, Dawson, Lubbock, Floyd, Lamb, Bailey, Gaines and Lynn Counties; LB, $101,128, flexible base, b. conc. 7.999 mi. Hy. US 77, Proj. C 370-4-9, Victoria Co.;

J. M. Dellinger, Inc., P.O. Box 4227, Corpus Christi, Tex., LB, $136,055, grading, add base and two course surf. tr. 12.371 mi. Hy. SH 72, Proj. S 32 (8), Karnes Co.;

J. M. Dellinger, Inc. & J. M. Dellinger, P.O. Box 4227, Corpus Christi, Tex., LB, $87,146, grading, structures, base and surf. 7.416 mi. Hy. FM 1074, Proj. S 1721 (1), San Patricio Co.;

Dew Constr. Co., Inc., P.O. Box 641, Tuler, Tex., LB, $68,366, soil asph. base, one course surf. tr. 9.126 mi. Hy. SH 274, Proj. S 129 (3), Henderson Co.;

Gulf Bitulithic Co., P.O. Box 2572, Houston, Tex., LB, $220,804, flexible base, b. conc. 18.654 mi. Hy. SH 158, Proj. C 463-3-7 & 8, Midland Co.;

H. R. Henderson & Co., P.O. Drower 313, Henderson, Tex., LB, 116,876, grading, structures, base, surf. 8.848 mi. Hy. FM 1001 and 1993, Proj. S 1424 (2), R 734-2-2, Titus Co.;

Killian-House Co., 4600 Broadway, San Antonio, Tex., LB, $508,179, flexible base, b. conc. 10.356 mi. Hy. SH 346, Proj. S 58 (4), Bexar Co.;

Ernest Loyd, P.O. Box 1120, Fort Worth, Tex., LB, $76,084, grading, structures, base, surf. 6.39 mi. Hy. FM 107, Proj. S 1188 (3), Coyrell and McLennan Counties; LB, $84,793, grading, structures, base, surf. 9.322 mi. Hy. FM 1212, Proj. S 1901 (1), Martin Co.; LB, $114,599, grading, structures, base, surf. 7.117 mi. Hy. FM 281, Proj. S 302 (2), Hutchinson Co.;

Maupin Constr. Co., P.O. Box 6643, San Antonio, Tex., LB, $160,013, flexible base, two course surf. tr. 10.774 mi. Hy. US 190, Proj. F 767 (8), San Saba Co.;

Dave McCollough, P.O. Box 52, Carthage, Tex., LB, $97,259, grading, structures, base and surf. 6.098 mi. Hy. FM 1414, Pro. S 1492 (2), R 1300-1-7, Newton Co.;

R. W. McKinney, P.O. Box 190, Nacogdoches, Tex., LB, $248,810, flexible base, hot mix b. conc. 4.239 mi. Hy. US 75, Proj. C 47-1-21, Grayson Co.; LB, $133,097, grading, structures, base, surf. 6.238 mi. Hy. FM 121, Proj. S 442 (3), Grayson Co.;

Hugh McMillan, P.O. Box 1227, El Paso, Tex., LB, $508,790, flexible base, b.conc. 19.367 mi. Hy. US 62 and 180, Proj. F 49 (7), El Paso Co.;
Harry Newton, Inc., Graham Land Office Bldg., Graham, Tex., LB, $474,065, soil cement base and hot mix b. conc. 17.781 mi. Hy. SH 79, Proj. C 283-2 & 3-B & 2, Archer Co.; LB, $83,556, widen structures 0.149 mi. Hy. US 277 and 83, Proj. C 157-5-16, etc., Jones and Taylor Counties;
Holland Page, P.O. Box 1181, Austin, Tex., LB, $475,379, flexible base, b.conc. 8.381 mi. Hy. US 90A and SH 60, Proj. F 506 (12) and F 15 (3), Wharton Co.; LB, $87,399, grading, structures, base, surf. 5 mi. Hy. FM 149, Proj. S 349 (3), Montgomery Co.;
M. E. Ruby, San Marcos, Tex., LB, $93,493, flexible base, b.conc. 1.808 mi. Hy. US 290, Proj. F 236 (9), Washington Co.; LB, $181,551, grading, struc. Proj. S 1916 (1), R 1165-2-3, etc., Fayette, Austin fures, base, surf. 11.095 mi. Hy. FM 1457 and 1291, and Colorado Counties;
Schwope Bros., 6633 W. Commerce St., San Antonio, Tex., LB, $141,952, seal coat 170.493 mi. Hy. US 90, 59, 290, etc., Proj. C 25-5-7, etc., Gonzales, Victoria, Jackson, Fayette, Calhoun, Lavaca, Wharton, Colorado and Dewitt Counties;
Strain & Brown, Inc., P.O. Box 1057, San Angelo, Tex., LB, $92,377, soil cement base, asph. surf., 5.072 mi. Proj. C 514-1-10, Wichita Co.;
Dean Word Co., P.O. Box 330, New Braunfels, Tex., LB, $211,586, foundation course, flexible base, one course surf. tr., b.conc. 4.942 mi. Hy. US 87, Proj. F 440 (16), Wilson Co. Bids Apr. 14. CD 4/2, 4/1, 4/5,+3/30, 3/35, 3/19.
Russ Mitchell, Inc., 5304 Old Spanish Trail, Houston, Tex., LB $373,252, est. $446,000, Sect. 2 Little White Oak Trunk sanitary sewer from Robert Lee and Enid to Brookshire Sts., HOUSTON, TEX. City, City Hall, 900 Brazos St., Houston, Tex., Frank Baldwin, c/o owner, Dir. P. Wks. Engr. Bids Apr. 9.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Stout-Iowa Homes, Inc., 4110 Wakona St., Des Moines, Ia., Owner Builds, $1,000,000, 134 DWELLINGS, DES MOINES, IA.
▲ Fruin-Colnon Contg. Co., 1706 Olive St., St. Louis 3, Mo. LB $3,008,022. 4 story, bsmnt., 218x244 ft., stone, brick, rein.-con. DEPARTMENT STORE and SHOPPING CENTER, Clayton Rd. and Brentwood Blvd., RICHMOND HEIGHTS (ST. LOUIS 17, P. O.), MO. Stix, Baer & Fuller Co., Arthur B. Baer, pres., Washington Ave., St. Louis 1, Mo. Bids Mar. 11. CD 2/24.
J. B. Fooshee, 1321 Buckaneer Dr., Abilene, Tex., Own Forces. $342,500, 34 DWELLINGS; $373,500, 38 DWELLINGS, ABILENE, TEX. CD 3/24.
Don Barnes Building Co., 1218 Cross Timbers St., Houston, Tex., Own Forces. $390,000. 41 DWELLINGS, HOUSTON, TEX. CD 3/23.

FAR WEST

SOON LETS CONTRACT—BUILDINGS

Wash., Spokane—SHOPPING CENTER—Western Realty & Holding Co., W 1017 Riverside Ave., soon lets contract, first section, 1 story, rein-con., 64,000 sq. ft. of Northtown Shopping Center, $700,000. C. G. Tollefson, W 1017 Riverside Ave., archt. CD 3/30.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Uranium Reduction Co., c/o E. H. Snyder, Felt Bldg., Salt Lake City, Utah, CA, Approx. $4,000,000. URANIUM MILL, MOAB, UTAH. Utex Exploration Co. and Combined Metals Reduction Co., Moab. CD 10/20.
▲ Stutz Enterprises, 1024 State St., San Diego, Calif. CA, $3,500,000. HOTEL, incl. swimming pool, LAS VEGAS, NEV. Pat O'Brien's Hotel, Las Vegas, Nev. (Correction—name of contractor). CD 4/15, under CA.
W. P. Cozza, N 5003 Oak St., Spokane, Wash., Day Labor, $595,000, 44 HOUSES, SPOKANE, WASH. N. A. Kabush, Hutton Bldg., archt.
▲ Anderson-Westfall Co., 2470 N. W. Nicolai St., Portland, Ore., CA, Approx. $1,000,000. Gateway SHOPPING CENTER, 50,000 sq. ft. rein.-con. store, 20 specialty shops, 1,200-car parking, PORTLAND, ORE. Fred Meyer, Inc., 721 S. W. 4 St., Portland, Ore. John Jensen, 2266 N. W. Lovejoy St., Portland, Ore., archt. Awarded Apr. 12.
C. M. Corkum Co., 2630 S. W. 2nd. St., Portland, Ore., LB, $663,880. Marcus Whitman Elementary SCHOOL, PORTLAND, ORE. Multnomah School Dist. 1, 631 N.E. Clackamas St., Portland, Ore., Bids Apr. 12. CD 3/22.
▲ Clayton Valley Builders, 4230 Clayton Rd., Concord, Calif., Own Forces. $3,000,000. SHOPPING CENTER, CONCORD, CALIF. Knorr Associates, 143 Bush St., San Francisco, Calif., archts.

CANADA

BIDS ASKED—BUILDINGS

▲ N. B., Camp Gagetown—TRAINING CENTER SERVICES—B.A. 5/4—Defence Constr. Ltd., 56 Lyon St., Ottawa, Ont., services at Army Camp, incl. 17 mi. roads, 18 mi. 6- to 42-in. sewers; 5.3 mi. concrete service tunnels; 21 mi. 10 in. diam. and less hot water piping; 750,000 gal. elevated water tank; 14 mi. 4- to 10-in. water mains; 1 m. cu. yd. common excav. for all above items. Total est. $4,000,000. Plans deposit $100. CD 8/1/52, under N. B., St. John.
Ont., Sarnia—SCHOOL—B.A. 5/18—Sarnia Bd. Educ., Mrs. M. B. Beasley, secy., 2 story L-shaped, 223x366 ft., concrete, brick, high school (collegiate). $700,000. Plans deposit $25. S. B. Coon & Son, 745 Mt. Pleasant Rd., Toronto, archts. CD 2/14/52.

SOON LETS CONTRACT—BUILDINGS

Ont., Hamilton—CLUB HOUSE—Leander Boat Club, foot of John St., soon lets contract club house. $600,000. Prack & Prack, 310 Main St. E., archts. CD 11/27.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Grinnell Co. of Canada Ltd., 3980 Namur St., Montreal, Que., CA, $461,161 fire protection system, MONTREAL, QUE. Govt. of Canada, Dpt. National Defence, Cartier Sq., Montreal, Que.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Canadian Constr. Co., 3750 Yonge St., Toronto, Ont. Owner Builds, $6,000,000, 500-suites in 5 buildings, APARTMENT PROJECT, Yonge St. South Yonge St. Cloverleaf, North York, TORONTO, ONT.
▲ Marshall Development Co., 285 Park Lawn Rd., Toronto, Ont. Owner Builds, $12,000,000, two 50-suite APARTMENTS, Yonge St. east side of Hill St., North York, TORONTO, ONT. Crang & Boake, 79 Huntley St., Toronto, Ont., archts.
▲ Leon M. Adler, 75 Manseau Ave., Montreal, Que., CA, $1,250,000, 200 BUNGALOWS, ST. LAMBERT, QUE. David Zap, 3275 Linton Ave., Montreal, Que. D. F. Lebensold, 3201 Forest Hill Ave., Montreal, Que., archt.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† Reed & Martin, Box 568, Fairbanks, Alaska, CA $775,115, est. $799,792, Third St. utilidor, Eielson Air Force Base, Inv. 54-76, ALASKA. U. S. Eng., Anchorage, Alaska. Bids Apr. 7. CD 4/14, under LB.

Proposed Projects

WATER SUPPLY

▲ Ill., Decatur—City, water sys. expansion, $3,000,000, Warren & Van Praag, 250 S. Park St., consult. engrs. CD 1/19/49.

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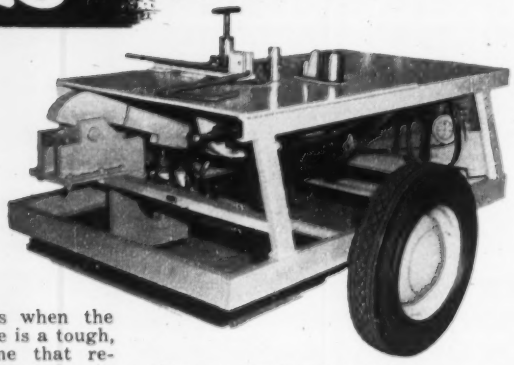

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▲ **Tex., Pittsburg, Mount Vernon, Mount Pleasant**—Cities of Pittsburg, Mount Vernon and Mount Pleasant, water reservoir and pipe line to supply city with domestic and industrial needs, 45,000 acre ft. water will be impounded, reservoir will be on Cypress Creek, between Mount Pleasant and Pittsburg. $3,000,000. Brown & Root, Inc., Eng. Div., 4100 Clinton Dr., Houston, consult. engr.

SEWERS, WASTE DISPOSAL

▲ **O., Cleveland**—Cuyahoga Co., Court House, Hilltop Sewage Disposal Proj.; diversion line from Green Rd. along Greenvale and Lancaster Rds. to Belvoir Blvd. to Easterly Sewage Plant; 3 mi. trunk sewer from Green Rd. along Wilson Mills Rd. to new sewage plant in Mayfield Village; two new pumping stations. $1,900,000. John H. Puzenski, co. engr. CD 11/14/50.

EARTHWORK, WATERWAYS

▲ **California**—Sonoma County Flood Control & Water Conservation District, 505 Rosenberg Bldg., Santa Rosa, postponed bond election to November for $4,598,000 bonds for Coyote Valley Dam on Russian River. This is district's contribution to project to be constructed by the U. S. Engineers, San Francisco. CD 3/18.

▲ **Quebec**—Quebec Hydraulic Resources Dpt., Quebec City, about ¼ mi. concrete dam, replacing old wooden dam at source of Gatineau River, 125 mi. north of Maniwaki. $4,000,000.

PUBLIC BUILDINGS

▲ **Calif., Los Angeles**—SCHOOL—Los Angeles City School District, 1425 S. San Pedro St., plans by Austin, Field & Fry, 2311 W. 3 St., Francis Polytechnic High School, Sun Valley, $2,426,000; plans by Bowerman, Hobson & Winter, 21454 Providencia St., Woodland Hills, multi-purpose bldgs., Camelia Ave., Case St., Lorne St. and Riverside Dr., Stonehurst Ave., Woodland Hills Schools, $633,000. CD 6/13/52.

▲ **Colo, Colorado Springs**—CITY, COUNTY—City, City Hall, 2 story U-shaped city and county bldg. $1,750,000.

▲ **Ill., Chicago Heights**—SCHOOL—School District 206, 10 St., plans by Schmidt, Garden & Erikson, 104 S. Michigan Ave., Chicago, Zone 2, Bloom Township High School Addn. $2,000,000. CD 3/5/51.

▲ **Mich., Grand Rapids**—JAIL—Bd. Supervs. Kent. Co., voted $1,500,000 bonds Apr. 5, county jail, J. & G. Daverman Co., 924 Grandville St., archts. CD 3/15.

▲ **Minn., Minneapolis**—HEALTH CENTER—City, Mrs. A. Finkle, clk., plans by Thorshov & Cerny, 400 Metropolitan Bldg., public health center, Fourth St. and Third Ave. South. $3,000,000. CD 4/11/45.

▲ **N. Y., Long Island City**—SCHOOL—Bd. Educ., 49 Flatbush Ave. Exten., Brooklyn, Zone 1, plans by DeYoung, Moscowitz & Rosenberg, 205 E. 42 St., New York Zone 17, Long Island City High School alterations, 41 Ave. between 28 and 29 Sts. $1,810,000. CD 5/7/47.

▲ **N. Y., Salamanca**—HOUSING—Salamanca Housing Auth., Salamanca, plans by William Lescaze, 211 E. 48 St., New York, garden type apartment 100-facilities, 11.75 acres, Front St. $1,500,000. CD 3/26/53.

▲ **Ore., Corvallis**—COLLEGE BUILDINGS—State Bd. Higher Educ., University of Oregon, Eugene, first unit of biological and agricultural science bldg. $1,300,000; second unit, biological and agricultural science bldg. $1,500,000; physics-chemistry bldg., $1,500,000; men's dormitory, $750,000; mechanical engineering wing, $750,000; agricultural engineering bldg., $700,000; physical plant bldg., $400,000; second unit of utility tunnel, $400,000; East wing, library, $330,000, Oregon State college.

▲ **Tex., Arlington**—HIGH SCHOOL—Arlington Independent School Dist., Arlington, plans by P. G. Geren, 1607 Ft. Worth Natl. Bldg., Fort Worth, and Buford & Feinberg, 326 Interurban Bldg., Dallas, high school. $1,000,000. CD 8/19.

▲ **Tex., Austin**—SCHOOLS—Austin Independent School Dist., Austin (A) masonry elementary school, $475,000, (B) elementary school, $350,000, (C) elementary school, $375,000, (D) elementary school, $425,000, (E) Northside High School, $1,675,000, (F) Southside High School, $1,750,000, (G) labor ry, $400,000.

▲ **Wash., Pullman**—VETERINARY HOSPITAL, etc.—Washington State College, Pullman, completion veterinary hospital, $1,520,000, agricultural sciences facilities, $2,419,510. CD 4/2/48.

▲ **Wis., Madison**—SCHOOL—Bd. Educ., 351 W. Wilson St., plans by Siberz, Purcell, Cuthbert & Newcomb, 1920 Monroe St., 2 story L-shaped 80,000 sq. ft. Crawford Heights Junior High School and Grade School $1,250,000.

COMMERCIAL BUILDINGS

▲ **Ala., Birmingham**—SHOPPING CENTER—Mr. and Mrs. O. O. Fowler, Huffman-Pinson Road, plans by Pemberton & Mims, Title Guarantee Bldg., shopping center, $1,000,000.

▲ **Ala., Birmingham**—RESIDENCES—Forney B. Tray, Tarrant City, 80 residences, $1,000,000.

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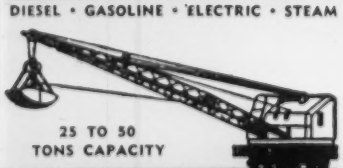

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2036 ADDISON, HOUSTON 25, TEXAS
St. Louis—Minneapolis—Denver—New Orleans

▲ Ala., Montgomery—HOSPITAL—St. Margaret's Hospital, 834 Adams Ave., hospital addn. $1,500,000. CD 12/9/49.

▲ Ky., Louisville—BANK—Federal Reserve Bank, 411 Locust St., St. Louis, Mo., plans by Russell, Mullgardt, Schwarz & Van Hoefen, 721 Olive St., St. Louis, Mo., branch bank, Fifth and Liberty Sts., $3,000,000.

▲ Minn., Bloomington (Minneapolis P.O.)—SHOPPING CENTER—A. G. Bogen Co., First National Bank Bldg., Minneapolis, plans by Thorshov & Cerny, 400 Metropolitan Bldg., Minneapolis, shopping center containing 24 stores, Hy. 100 and Nicollet Ave. $1,000,000.

▲ Mo., Olivette (St. Louis 14 P.O.)—RESIDENCES, etc.—Melvin H. Glick & Co., 44 N. Brentwood Blvd., Clayton, Zone 5, plans by Isador Shank, 2 S. Brentwood Blvd., Clayton, Zone 5, development of subdivision, incl. 1,000 residences, supermarket, shopping center of at least 10 major stores, other shops, 300 acres north side of Olive St. Rd. east of Lindbergh Blvd. $20,000,000, Horner & Shifrin, Shell Bldg., 1221 Locust St., St. Louis, Zone 3, consult. engrs.

▲ Neb., Omaha—BANK—Federal Reserve Bank, 10 and Grand Sts., Kansas City, Mo., plans by John Latenser & Sons, 1307 Farnam St., Omaha Branch addn. of Federal Reserve Bank, $1,500,000.

▲ N. Y., Hicksville—SHOPPING CENTER—Stackler & Frank, 204 Front St., Hempstead, plans by Lathrop Douglass, 518 Fifth Ave., New York 35, N. Y., Mud Island Plaza shopping center, 110-acre site, west side of Broadway. $25,000,000. CD 10/15.

▲ N. Y., Huntington—SHOPPING CENTER—Syndicate, c/o Feist & Feist, 100 Park Ave., New York Zone 17, plans by Joseph J. & Lawrence H. Furman, 303 W. 42 St., New York Zone 36, Walt Whitman shopping center, 60-acre site, Rte. 110, between Jericho Turnpike and Northern State Parkway, $5,000,000.

▲ Pa., Pittsburgh—APARTMENT—Raymond Bouch, Schenley Hotel, plans by A. E. Tennyson, 555 Washington Rd., 8 story bsmt., brick, steel apartment, 216 suites. $4,500,000.

▲ Tex., Freeport—SHOPPING CENTER—Freeport Land Co., c/o Dan M. Moody & Wm. M. Dickey, Abstract & Title Bldg., Houston, 90,000 sq. ft. masonry shopping center, 9-acre tract, Cherry and 2nd Sts. $1,500,000.

▲ Tex., Houston—SHOPPING CENTER—Home Owned Properties, Inc., c/o John H. Crooker, Jr., 1306 Texas St., Unit 2, masonry shopping center, 22½ acre tract in Cloverleaf Area to serve Home Owned Estates and surrounding territory, $4,000,000. CD 12/8, under Dan Moody Assoc. as owner.

▲ Va., Annandale—SHOPPING CENTER—Michael Development Corp., 2024 N. Kirkwood St., Arlington, 2 story, masonry shopping center. $5,000,000.

INDUSTRIAL BUILDINGS

▲ Ariz., Rillito—KILN—Arizona Portland Cement Co., Rillito, third kiln at cement plant. $3,000,000. CD 6/11/51.

▲ Fla., Jacksonville—PARKING GARAGE—Model Land Co., c/o Carl Hawkins, St. Augustine, auto parking garage, $1,000,000.

▲ Kan., Great Bend—POWER PLANT—Western Light & Telephone Co., 2015 Forest Ave., power plant expansion. $3,000,000, Sargent & Lundy, 140 S. Dearborn St., Chicago, Ill., consult. engrs.

▲ La., New Orleans—BREWERY—Anheuser-Busch, Inc., August A. Busch, Jr., pres., 721 Pestalozzi St., St. Louis 18, Mo., 1 million bbl. per year capacity beer brewing and bottling plant, incl. brew house, grain elevator, stock house, fermenting cellar, bottle shop, various warehouse and auxiliary facilities on site in Jefferson Parish, adjacent to Huey Long Bridge, $20,000,000-$25,000,000, Sverdrup & Parcel, Inc., 917 Olive St., St. Louis 1, Mo., consult. engr. CD 2/15.

▲ La., New Orleans—BREWERY PLANT—Anheuser-Busch, Inc., 314 Girod St., New Orleans, brewery plant, $25,000,000. Fromherz Engineers, 823½ Poydras St., and Svedrup & Parcel, Inc., Syndicate Trust Bldg., St. Louis, Mo., consult. engrs. CD 4/12.

▲ Mass., Norwood—MANUFACTURING, etc.—Mason-Neilan Regulator Co., 1190 Adams St., Dorchester, plans by Harry J. Korslund, 506 Washington St., mfg. and office bldg., Providence Hy. $1,000,000. CD 12/24.

▲ Pa., Pittsburgh—WAREHOUSE, etc.—O.K. Grocery Co., 1728 Smallman St., plans by Mitchell & Ritchey, 430 Alcoa Bldg., 1 story, 300x300 ft., brick, block, steel warehouse and office, 35 and A. V. P. R. $1,000,000.

UNCLASSIFIED

▲ Me., Bar Harbor—PIER FERRY TERMINAL—State, Maine Port Auth., 40 Commercial St., Portland, pier, ferry terminal, $1,000,000. Fay Spofford & Thorndike, 11 Beacon St., Boston, Mass., consult. engrs. CD 4/15.

▲ Okla., Tahlequah—GAS LINE—City, voted bonds, natural gas transmission line and distr. sys. $1,200,000. R. K. Dohe, c/o owner, engr. CD 4/14/53.

▲ Tennessee—RURAL DISTRIBUTION LINES, etc.—Duck River Electric Membership Corp., 210 S. Main St., Shelbyville, Tenn., 210 mi. rural distr. line system imprvs. and completion of previously approved construction, $1,425,000. CD 6/8/50.

▲ Washington—RURAL DISTRIBUTION LINES—Grant County Public Utility District No. 2, 30 C. St. S. W., Ephrata, rural distr. lines. $1,000,000.

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
May 4 Massachusetts
STREETS AND ROADS
May 4 Massachusetts

† **Massachusetts**—AAA FACILITIES—B.A. On Or About 5/19—U. S. Eng., 857 Commonwealth Ave., Boston, Zone 15, constr. special AAA facilities for 2 batteries, control area, launcher area, concrete block masonry bldgs., concrete bldgs., at Squantum-Long Island and Hog Island-Weymouth, ENG-19-016-54-103. $500,000-$1,000,000.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **MAINE**—Maine Turnpike Auth., 17 Bishop St., Portland,
Carlo Bianchi & Co., Inc., 24 Union Ave., Framingham, Mass. LB Alt. A $1,537,058; Alt. B $2,011,479, est. $2,000,000, Contr. 211.
Campanella & Cardi Constr. Co., 789 Jefferson Blvd., Warwick, R. I. LB $786,548, est. $800,000, Contr. 211A;
A. T. Sargent, Stillwater, Me. LB $1,185,847, est. $1,200,000. Contr. 211B, Sect. 2 grading, drainage, Augusta Exten., Gardiner, Augusta and Farmingdale. Bids Apr. 16. CD 4/2.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
May 14 Pennsylvania
STREETS AND ROADS
May 6 New Jersey, New York May 7, 14 Pennsylvania

BIDS ASKED—BUILDINGS

† **N. Y., West Point**—BARRACKS—B.A. 5/27—U. S. Eng., 80 Lafayette St., New York, Zone 13, rehabilitation of cadet barracks, U. S. Military Academy, $500,000-$1,000,000. Bid date changed. Greenberg & Ames, 303 Fourth Ave., New York, Zone 10, archts. CD 3/17.

▲ **N. Y., Flushing**—APARTMENT—Bids Asked—Radnorf Realty Corp., c/o Henry Kibel, archt., 18 E. 53 St., New York, Zone 22, 9 story apartment, 147 St. and Sanford Ave., $2,000,000. Greenhut & Taffel, 2 Columbus Circle, New York, Zone 19, engrs.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—New York State Bridge Auth., The Governor Alfred E. Smith State Office Bldg., Albany,
Merritt-Chapman & Scott Corp., 260 Madison Ave., New York, 16, N. Y., LB $4,495,477, total est. cost $20,000,000. Kingston-Rhinecliff Bridge substructure continuous truss crossing over Hudson River, 3.5 mi. north Kingston, Ulster & Dutchess Counties. Bids Apr. 20. CD 3/12.

† **Peter Reiss Constr. Co., Inc.**, 105 Court St., Brooklyn 2, N. Y., CA, $807,044, anti-aircraft facilities Serial No. ENG.-30-075-54-211, FORT TILDEN, N. Y. U. S. Eng., 80 Lafayette St., New York 13, N. Y. Bids Apr. 13. CD 3/16.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Bayport Estates**, c/o Herman York, archt., 190-04 161 St., Jamaica, N. Y., Owner Builds, $2,500,000. 250 HOUSES on tract on Second Ave., north of Montauk Highway, BAYPORT, N. Y.

▲ **Birchwood Park Homes**, c/o Stanley H. Klein, archt., 89-31 161 St., Jamaica, N. Y. Owner Builds, $2,000,000 140 HOUSES on 28-acre tract at Exit of Northern State Parkway, HICKSVILLE, N. Y.

▲ **Locust Builders, Inc.**, c/o Lawrence H. Rothman, archt., 47 E. 125 St., New York 34, N. Y. Owner Builds, $1,300,000. 6 story APARTMENTS for 168 families to be called Rochelle Gardens, on Locust Ave., NEW ROCHELLE, N. Y.

▲ **Vermilya-Brown Co., Inc.**, 100 E. 42 St., New York 17, N. Y., CA, $2,600,000, 5 story HOSPITAL addn., NEW ROCHELLE, N. Y. New Rochelle Hospital, Guion Pl., New Rochelle, N. Y. Bids Mar. 1. CD 2/10. Eggers & Higgins, 100 E. 42 St., New York, 17, archts.

▲ **800 Grand Concourse Corp.**, c/o H. I. Feldman, archt., 415 Lexington Ave., New York 17, N. Y. Owner Builds, $2,500,000, APARTMENT, Grand Concourse and East 158 St., NEW YORK, N. Y.

▲ **Hausch Manor Homes**, c/o Henry A. Klar Realty Co., 220-02 Horace Harding Blvd., Bayside Hills, N. Y. Owner Builds, $1,900,000, 140 HOUSES on tract on East Clinton Ave., east of Nassau Rd., ROOSEVELT, N. Y.

▲ **Montvale Manor Homes**, c/o C. J. Kordys, 116 Passaic St., Passaic, N. J. Owner Builds, $1,400,000. 110 HOUSES on tract on Grand Ave. east of Kinderkamack Rd., MONTVALE, N. J.

▲ **Phillip J. Levin**, 104 W. 4th St., Plainfield, N. J. Owner Builds. $4,000,000. SHOPPING CENTER, 28 acre tract at junction of Rte. 1, Milltown and Georges Rds., NORTH BRUNSWICK TWP., N. J. Kelly & Gruzen, 80 Fifth Ave., New York 3, N. Y., archts.

▲ **Construction Management, Inc.**, 1542 West Washington St., Indianapolis, Ind., CA, $1,000,000, "Chows" feed mfg. PLANT, St. Johns Road between Trindle Road and the railroad east of SHIREMANSTOWN, PA. Ralston Purina Co., 835 S. 8 St., St. Louis, Mo. H. F. Shealy, c/o Construction Management, Inc., c/o Penn-Harris Hotel, Harrisburg, Pa., ch. engr. CD 4/16, under CA.

SOUTH

STATE HIGHWAY LETTINGS
BRIDGES
May 4 Virginia
STREETS AND ROADS
May 12, 26 Louisiana

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Lang Constr. Co.**, 21 S. King St., Hampton, Va. CA $1,274,000. steam plant, Naval Amphibious Base, NOY 77141, LITTLE CREEK, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Va. CD 3/30, under LB.

† **Mechanical Eng. Corp.**, 232 Bank St., Norfolk, Va. CA $898,496. electrical distr. sys., sub-stations, Naval Amphibious Base, NOY 78215, LITTLE CREEK, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Va. CD 3/19, under LB.

▲ **FLORIDA**—State Road Dpt., Tallahassee,
Industrial Constr. Co., 3050 4 Ave. South, Minneapolis 8, Minn., CA, $936,309, 999.25 ft. bridges over Steinhatchee River (Intracoastal Waterway) and 165 ft. bridge Mercedes River State Rd. A-1-A, Job 8618-178, Fort Lauderdale, Broward Co. Bids Feb. 25, awarded Apr. 16. CD 3/2, under LB.

FLORIDA—State Road Dpt., Tallahassee,
Scott Constr. Co., Thomasville, Ga., LB, $759,744, bridge over St. Johns River at Crows Bluff and roadway approaches State Rd. No. 44, Job 1111-106 and 7907-108, Lake and Volusia Counties. Bids Apr. 20. CD 3/24.

BUILDINGS

LOW BIDS AND CONTRACTS

Cannon & Lewis, 1609 Duke St., Alexandria, Va. CA Approx. $850,000. seventy 1 story, masonry RESIDENCES, near ALEXANDRIA, VA. Hollin Hall Development Co., P. O. Box 1039, Alexandria, Va.

▲ **Tidewater Constr. Corp.**, 538 Front St., Norfolk, Va. CA Approx. $2,000,000. 1 story, steel, masonry mfg. paper PLANT, FRANKLIN, VA. St. Regis Paper Co., 230 Park Ave., New York, N. Y. CD 11/27.

▲ **Crestwood Constr. Corp.**, 4415 Wilson Blvd., Arlington, Va., Owner Builds, $8,500,000, 1,000 unit APARTMENT, SPRINGFIELD, VA.

▲ **John J. Hay**, 49 Summit St., Fort Thomas, Ky. Owner Builds. $2,925,000. 195 brick HOUSING units in Hollyacres subdivision off Summit Ave., FORT THOMAS, KY. Morlidge & Morlidge, 104 W. Fourth St., Cincinnati, O., engrs. Awarded Apr. 16.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
May 5 Michigan
STREETS AND ROADS
May 5 Michigan

BIDS ASKED—BUILDINGS

Ill., **Belleville**—SCHOOL—B.A. 5/14—School District No. 118, E. L. Allen, supt. Schools, Jefferson School addn. and Union School addn. $800,000. CD 12/9.

▲ **O., Dayton**—SCHOOL—B.A. 5/15—Bd. Educ., 232 N. Main St., high school in Belmont Area. $2,185,000. Hart, Igleburger & Assoc., Hulman Bldg., archts. CD 11/12/51.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **OHIO**—State Hy. Dpt., S. O. Linzell, dir., Columbus.
The Great Lakes Constr. Co., Box 2278, Brooklyn Station, Cleveland, O. LB $251,179, est. $290,500. Type T-35 3.056 mi. SR 87-7.72, S-9 (8), Geauga Co.;
The A. Bentley & Sons Co., Inc., 201 Belmont Ave., Toledo, O. LB $1,025,000, est. $986,900. Type T-71 and structures 0.776 mi. city of Toledo, SR 246-15.55, U-UG-848 (2), Lucas Co.;
A. J. Baltes, Inc., 11 Olive St., Norwalk, O. LB $572,263, est. $555,500. Type T-35 on B-119 and structures 2.447 mi. SR 73-10.16, S-492 (3), Scioto Co.;
Walter H. Jones, Rte. No. 1, Wooster, O. LB $67,817, est. $61,800. Type T-35 2.096 mi. CR 52, S 453 (2), Wayne Co.;

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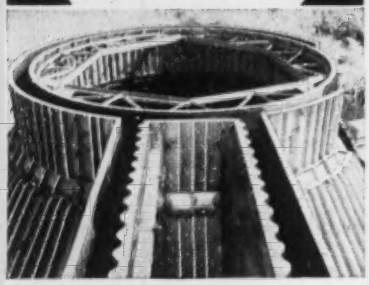

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Rome Daugherty, Glenford, O. LB $155,446, est. $190,900. Type T-32 on B-119 and structures 0.79 mi. SR 2310-(3.74) (5.39) (6.20) S-194 (2), Wyandot Co.;

The F. H. Brewer Co., P.O. Box 372, Lancaster, O. LB $132,288, est. $145,000. Type T-35 7.647 mi. SR 37-(6.35) (7.45) (.74-14.39), Fairfield Co.;

Allegheny Asphalt & Paving Co., Inc., 801 Bingham St., Pittsburgh, Pa. LB $779,557, est. $793,300. Type T-35 and structures 1.834 mi., SR 18-(9.41-10.82), Mahoning Co.;

Smith Constr. Co. of Ohio, P.O. Box 515, Vienna, O. LB $898,042, est. $966,900. Type-T-35 and structures 4.192 mi., city of Youngstown, SR 18-(11.24-14.29), Mahoning Co.;

Harper Supply Inc., 118 W. Front St., Napoleon, O. LB $602,650, est. $651,000. Type-T35 and structure 6.855 mi. Alt. A or B, city of Celina, USR 127-(14.24-20.99), Parts Nos. 1 and 2), Mercer Co.;

Shelly & Sands, Inc., Thornville, O. LB $162,369, est. $160,700. Type T-35 8.987 mi. SR 77-0.00, (4.46-8.16), Parts Nos. 1 and 2, Muskingum Co.;

George H. Cheek Constr. Co., 300 McClure Bldg., Frankfort, Ky. LB $1,065,992, est. $1,348,500. Type-T-71 5.226 mi., USR 21-(2.19-6.60), Noble Co.;

C. E. Edgington & Sons, 1220 S. Main St., Findlay, O. LB $78,977, est. $84,100. Type T-35 on B-119 and structure, USR 224-14.00, Putnam Co.;

Leon H. Hopple, 181 Wentz St., Tiffin, O. LB $110,651, est. $125,000. Type T-32 on B-119 and structures 0.844 mi., village of Bettsville, SR 590-(0.03-0.31), (1.19), (2.05), (7.14), Seneca and Sandusky Counties;

Edgar Spring, Inc., New Philadelphia, Pa. LB $139,462, est. $149,450. Type T-35 4.991 mi. village of Wilmot, USR 62-(0.91-1.11), USR 250-0.24), Stark and Tuscarawas Counties;

Fred Walls & Son, New Weston, O. LB $98,688, est. $91,355. Type T-35 15.44 mi. Mercer Co. Bids Apr. 13. CD 3/31.

▲ J. A. Jones Constr. Co., 209 W. 4 St., Charlotte, N. C. LB. $5,565,550 for May 1, 1956 completion, LB. $5,766,750 for Aug. 1, 1955, completion, municipal water filtration plant, COLUMBUS, O. City, City Hall, Columbus, O. Bids Apr. 20.

City, Glenn C. Richards, supt. P. Wks., 104 City Hall, Detroit, Mich. Owner Builds. $600,000. repaving Jefferson Ave. from Randolph to East Grand Sts., paving obsolete street car tracks East Grand Blvd. to city limits, 6¾ mi., DETROIT, MICH. George R. Thompson, Detroit, Mich., city engr. CD 3/30/43.

BUILDINGS

LOW BIDS AND CONTRACTS

A. L. Wolf, 5416 Winton Rd., Cincinnati, O. Owner Builds. $925,000. 37 one story HOMES, Compton Rd., east of Colerain Park, CINCINNATI, O. I. Lazarus & Assoc., 2436 Reading Rd., Cincinnati, O., engrs. Awarded Apr. 14.

▲ Turner Built Homes, Inc., 2350 Victory Parkway, Cincinnati, O. Owner Builds. $1,850,000. one hundred and eleven 1-family units, 1 and 1½ story, bsmnt. HOUSING, in Ridgehille Subdivision, Fehrman and Ridge Aves., READING, O. E. A. Gast Eng. Co., 906 Main St., Cincinnati, O., engr. Awarded Apr. 20.

J. H. Findorff & Sons, Inc, 601 W. Wilson St., Madison, Wis., CA, $900,842, general contract COMMERCE bldg., MADISON, WIS. University of Wisconsin, Madison, Wis. Bids Apr. 1. CD 4/8, under LB.

▲ E. R. Hillebos, 1065 Field St., Detroit, Mich. Owner Builds. $1,600,000. 130 ranch type brick HOMES, section north of 14 Mile Rd. between Rochester and Stephenson Hy., CLAWSON, MICH.

▲ Huber, Hunt & Nichols, Speedway, Indianapolis, Ind. CA Est. $2,200,000. PLANT addns., steel storage, press shop, etc., GRAND RAPIDS, MICH. Fisher Body Div., General Motors Corp., General Motors Bldg., Detroit, Mich. CD 3/25.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

May 4 Iowa — May 6 Kansas

STREETS AND ROADS

May 4 Iowa — May 6 Kansas
May 7 Minnesota — May 18 Texas

▲ Mo., St. Louis—B.A. 5/18—City, Frank J. McDevitt, pres. Bd. P. Service, 304 City Hall, 12 and Market Sts., Zone 3, addni., storage basins, conduits for Howard Bend water pumping station on Missouri River to increase capacity of plant from 80 to 120 m.g. per day, $1,254,000. CD 12/4/52.

BIDS ASKED—BUILDINGS

Mo., St. Louis—SCHOOL—B.A. 5/4—Bd. Educ., V. Harry Rhodes, comr. School Bldgs., 911 Locust St., Zone 1, elementary school, 1925 Cass Ave. to serve M-1-5 housing area, $800,000. CD 4/30/53.

▲ Tex., Houston—PLANT, etc.—Bid Asked—Phillips Chemical Co. (subsidiary of Phillips Petroleum Co.) City Natl. Bank Bldg., polyethylene plant, 1100-acre tract on Ship Channel, $6,500,000; mechanical repair shop, $175,000; some warehousing, $275,000.

SOON LETS CONTRACT—BUILDINGS

Tex., Sherman—HOUSING—U. S. Govt., Contg. & Purch. Office, Perrin Air Force Base, Sherman, soon lets contract construct, manage, finance 300 housing units, Military Housing Proj. $772,000. Temple Phinney, 1705 Field St., Dallas, engr.-archt. CD 3/8.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† Eugene Luhr & Co., Columbia, Ill., CA $1,143,725, est. $1,500,000. Sect. 2 of Oklahoma City River Floodway, North Canadian River, Inv. No. CIVENG-34-066-54-31, OKLAHOMA. U. S. Eng., Box 61, Tulsa 2, Okla. Bids Feb. 25, awarded Apr. 1. CD 3/2, under LB.

▲† T. C. Bateson Co., Irwin-Keasler Bldg., Dallas, Tex. LB $1,843,697, est. $2,000,000. aircraft maintenance hangar, Altus Air Force Base, ENG-34-066-54-55, ALTUS, OKLA. U. S. Eng., Box 61, Tulsa 2, Okla. Bids Apr. 15. CD 3/15.

▲† T. C. Bateson Co., Irwin-Keasler Bldg., Dallas, Tex. LB $1,961,501, est. $2,000,000. maintenance hangar, Ardmore Air Force Base, ENG-34-066-54-55, ARDMORE, OKLA. U. S. Eng., Box 61, Tulsa 2, Okla. Bids Apr. 15. CD 3/15.

▲ Stonewall Gas Products Co., Inc., Stonewall, Tex., Owner Builds, $1,350,000, 100 mi. 2- to 10-in. gas gathering lines to supply gasoline plant in northeastern section of Stonewall Co., Aspermont area, TEXAS.

▲† A. J. Rife, 2608 Inwood Rd., Dallas, Tex., CA $1,214,862, est. $1,207,079, double cantilever maintenance hangar, Abilene Air Force Base, ENG-41-443-54-48, ABILENE, TEX. U. S. Eng., 100 W. Vickery St., Fort Worth, Tex., Bids Apr. 2, awarded Apr. 14. CD 4/6, under LB.

▲† Lawless & Alford, Inc., Box 600, Austin, Tex., CA $1,139,081, est. $1,000,000. 67,000 sq. ft. 100-bed hospital, Harlingen Air Force Base, HARLINGEN, TEX. U. S. Eng., Box 1229, Galveston, Tex. Bids Apr. 9. CD 4/13, under LB.

Colorado Constructors, Inc., 725 West 39 Ave., Denver, Colo., CA, $773,861, est. $1,300,000 Twin Lakes Reservoir, BOULDER, COLO. City, City Hall, Boulder, Colo. Bids Apr. 8, awarded Apr. 12. CD 3/29.

BUILDINGS

LOW BIDS AND CONTRACTS

Joseph H. Vatterott Realty & Bldg. Co., Joseph H. Vatterott, pres., 1500 S. Florissant Rd., Florissant, Mo. Owner Builds. $750,000. 1 story ranch type 114-room Holiday Inn HOTEL, U. S. 66, 1 mi. south of Lambert-Municipal Airport, ST. LOUIS COUNTY, MO. Ned Cole, 4601 E. 5 St., Austin, Tex., archt.

▲Martin K. Eby Constr. Co., Inc., 610 N. Main St., Wichita, Kan. LB $1,069,700, site preparation and foundations for MATERIALS BLDG., WICHITA, KAN. Boeing Airplane Co., Plant No. II, Personell Bldg., Wichita, Kan. Bids Apr. 15. CD 3/29.

J. M. Odom, Box 774, Austin, Tex., CA $776,035, CLASSROOMS and OFFICE STRUCTURE for English Dpt., AUSTIN, TEX. University of Texas, Main Admin. Bldg., Austin, Tex. Bids Apr. 7, awarded Apr. 15. CD 4/14, under LB.

▲ Tona Engineering Co., engrs., c/o owner, Brownsville, Tex., Purchase and Hire $1,975,000, REFINERY EXPANSION, BROWNSVILLE, TEX. McBride Oil & Gas Corp., Majestic Bdg., San Antonio, Tex. CD 2/3.

▲ Linbeck Constr. Co., Box 13007, Houston, Tex., CA $1,201,500, general constr., and all mechanicals for 6 story, bsmnt. OFFICE, foundation for a possible future 15 story bldg. by adding 9 more storys. HOUSTON, TEX. Old National Insurance Co., 2505 Travis St., Houston, Tex. Awarded Apr. 13. CD 4/15, under CA.

J. W. Crawford, 601 N. Aransas St., Alice, Tex., CA $815,795, est. $800,000. 1 story, 80,000 sq. ft., steel, brick exterior, cut stone trim HIGH SCHOOL, concrete pier and beam fdn., REFUGIO, TEX. Refugio Independent School Dist., Refugio, Tex. Bids Apr. 9. CD 4/20, under LB.

▲ White Auto Stores, 1507 Lamar St., Wichita Falls, Tex., Own Forces. Approx. $1,000,000. WAREHOUSE, OFFICE, WICHITA FALLS, TEX. CD 4/14.

▲ Robert E. McKee, General Contractor, Inc., Box 651, Albuquerque, N. M. and Box 1706, Santa Fe, N. M., LB $1,955,000, est. $1,000,000. A E C Group 16, HOUSING, Inv. No. 291-54-10, LOS ALAMOS, N. M. U. S. Govt. Chief Procurement Sect., Field Office, Los Alamos, N. M. Bids Apr. 6. CD 3/17.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

STREETS AND ROADS

May 6 Washington

▲ Calif., San Diego—TRANSIT SHED—B.A. 5/12—City, 1600 Pacific Hy., 200x996 ft. Transit Shed No. 2 on "B" St. Pier, $1,000,000. Plans deposit $10. Alden K. Fogg, c/o owner, engr. CD 12/6/44.

BIDS ASKED—BUILDINGS

▲ Calif., Los Angeles—SCHOOL—B.A. 5/7—Los Angeles City School District, 1425 S. San Pedro St., Van Owen-Coldwater Canyon Ave. Junior High School, $1,750,000. Risley & Gould, 2502 W. 3 St., archts. CD 6/13/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Davis & Butler, 422 Dooly Bldg., Salt Lake City, Utah, CA, $950,000, sewage disposal plant, PROVO, UTAH. City, Provo, Utah. Bids Mar. 10. CD 3/30, under LB.

▲† **English Electric Export & Trading Co.**, 23 Beaver St., New York, N. Y., LB, $1,946,410, 2 alternating current generators for Chief Joseph Dam, Bridgeport, WASHINGTON. U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, Wash.

† **Bay Constr. Co.**, 1762 Airport Way, and **Don. L. Cooney**, 1749 Airport Way, Seattle, Wash., CA, $890,762, Sch. 2, McNary Powerhouse Lines 3 and 4 and McNary-Wishram Section, McNary-Ross 345-kv line 90.9 mi. Inv. 7286, Klickitat and Umatilla Counties, WASHINGTON and OREGON. Bonneville Power Admin., 827 N.E. Oregon St., Portland, Ore. Bids Mar. 25, awarded Apr. 13. CD 4/5, under LB.

CALIFORNIA—State Div. Hys., Sacramento.

Macco Corp., Morrison-Knuden Co., Inc. and River Constr. Corp., 14409 South Paramount Blvd., Paramount, Calif. CA, $777,777, grading 5.4 mi., 2 bridges, widening 2 bridges, between Eureka and Gannon Slough, Humboldt Co. Bids Mar. 31. CD 4/8, under LB.

▲ **Macco Corp.**, Paramount, Calif., **D. & H. Constr. Co.** & **M. H. Hasler Constr. Co.**, 2131 Fulton Ave., Sacramento, Calif., CA, $3,534,826, est. $5,000,000. Santa Felicia Dam on Piru Creek of Santa Clara River, Calif. Watershed, Ventura Co., CALIFORNIA. United Water Conservation District, 806 Railroad Ave., Santa Paula, Calif. Bids Apr. 6. CD 4/12, under LB.

▲† **Oberg Brothers Constr. Co.**, 401 West Florence Ave., Inglewood, Calif., LB, $1,403,264, imprv. Rio Hondo Channel, (alternate using concrete pipe for bridges) Washington Blvd. to Santa Ana Freeway, Downey, Los Angeles Co., CIVENG-04-353-54-34, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Apr. 15. CD 3/17.

BUILDINGS

LOW BIDS AND CONTRACTS

Milton Kauffman Constr. Co., 2918 W. Compton Blvd., Gardena, Calif. Owner Builds. $879,600, 90 stucco DWELLINGS, Talisman, Darien and Bulova Sts. in Tract 19101, GARDENA, CALIF. James R. Friend, San Pedro, Calif., archt.

▲ **Crestview Estates**, 3029 Studebaker Rd., Lakewood, Calif. CA, $2,043,000, 190 frame, stucco dwellings Kallin, Karen and Leis Sts., etc., LAKEWOOD, CALIF Lakewood Rancho Estates and Crestview Estates No 2, 3029 Studebaker Rd., Lakewood, Calif.

CANADA

BIDS ASKED—BUILDINGS

▲ **Ont., Ottawa**—APARTMENT HOTEL—Bids Asked—Beacon Realty Co. Ltd., 30 Rideau St., Ottawa, Ont., 12 story 143 suite, rein.-con., brick, stone apartment hotel, Albert and Metcalfe Sts., Slater St., $1,000,000. Greenspoon, Freedlander & Dunne, 4151 Sherbrooke St. W., Montreal, Que., archts.

BUILDINGS

LOW BIDS AND CONTRACTS

Timms Constr. Co., South Main St., Welland, Ont., CA Est. $750,000, 1 story, part 2 story, 200x250 ft. brick, steel, concrete block FACTORY, DUNNVILLE, ONT. Sylvania Electric Co., University Tower Bldg., Montreal, Que. Bids Apr. 2, awarded Apr. 20. CD 3/15.

▲ **Foundation Co. of Canada, Ltd.**, 1220 Bay St., Toronto, Ont., CA, $4,140,000, HOSPITAL extensions and remodeling of 76 Grenville St., TORONTO, ONT. Women's College Hospital, 76 Grenville St., Toronto, Ont. Bids Mar. 11. CD 4/14, under LB.

Foundation Co. of Canada Ltd., 1900 W. Sherbrooke St., Montreal, Que., CA, $725,000, 242x415 ft., concrete, steel, brick auto parts WAREHOUSE, MONTREAL, QUE. Ford Motor Co. of Canada Ltd., Windsor, Ont. Bids Apr. 8. CD 3/31.

Cosmos (Quebec) Ltd., 1434 St. Catherine St. W., Montreal, Que., Owner Builds, $700,000, HOUSING DEVELOPMENT, Hislop, Theoret, Houde and Trudeau Sts., VILLE ST. LAURENT, QUE. E. Vincelli, 429 Jean Talon St. W., Montreal, Que., archt.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Lytle & Green and S. Birch & Sons**, Securities Bldg., Seattle 1, Wash. CA $1,042,060, est. $1,079,088. 22 rein.-con. igloos, 1.5 mi. access road 1 mi. spur track, Eielson Air Force Base, Inv. 53-44, ALASKA. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. CD 4/14, under LB.

† **Boen, Egge, Cummins & Koon**, 3647 Stone Way, Seattle 3, Wash. CA $937,072, est. $999,810. 27 rein.-con. ammo storage igloos 60x12 ft, 40x12 ft., Ladd Air Force Base, Inv. 54-62, ALASKA. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. CD 4/12, under LB.

AMERICANS ABROAD

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Thompson Starrett Co., Inc.**, 444 Madison Ave., New York 2, N. Y., U. S. A. CA, $15,000,000. Megdova River Power Project in Central Greece, incl. 114 ft. high dam, electric generating plant of 84,000 kilowatt hours capacity and two divisionary dams, GREECE, Government of Greece, Athens, Greece.

(Proposal Advertisements see pp. 112 to 115)

CEMENT GUN CO. RESTORES BRIDGE

Photo above shows the disintegrated condition of an abutment on a reinforced concrete bridge in a large Western Pennsylvania city. Repair work on this structure necessitated an almost complete rebuilding of the abutment. To accomplish this, the end span was jacked up and new expansion plates were placed at the bridge seats. In addition to repair of abutments—beams, girders, and arch ribs were reintegrated with "GUNITE" wherever disintegration had taken place.

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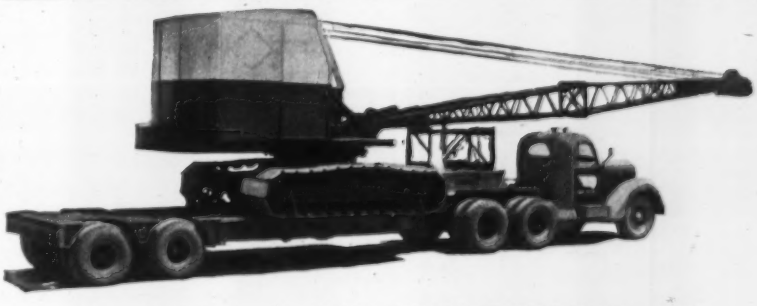

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UNIT PRICES

Industrial wastes boost cost of village sewer plant

When the $177,515 high-rate trickling filter sewage treatment plant for Lake Odessa, Mich., is prorated to the village's total design population of 9,100, a per capital cost of only $20 is the result. The 2,100 villagers, however, account for only 23% of the design population; 7,000 population equivalent of industrial wastes comprise the other 77%. The amount of the contract divided by the number of villagers results in an actual per capita cost of $85.

The plant, designed by The Francis Engineering Co., Saginaw, Mich., accommodates an average sewage gravity flow through primary tanks of 0.5 mgd. Two settling tanks will be 50′ x 12′ x 12′. Settled sewage is pumped to the trickling filter, 62-ft diameter, 6-ft stone depth; two 450-gpm pumps do the job. The sludge digestion tank has 30-ft diameter and is 23 ft deep. Existing septic tank will take care of sludge storage. Sludge drying will use 6,560 sq ft of new beds. A brick building with 10-ft basement will measure 27′ x 26′. Construction will include a Parshall measuring flume.

The contract went to Barnes Construction Co., Grand Rapids, Mich., for 1% less than the second low bid and 0.3% under the engineer's estimate. Eight bids were submitted.

A 24% difference in unit prices on the concrete bid accounted for $11,555 saved by the winning low bidder over the second low bidder. Total difference between the two low bids was $2,440.

The contractor starts work May 1; the job must be finished seven months later. Prevailing wage rates are: operating engineer $2.75 per hr, carpenter $2.55, skilled labor $2.05.

All sections were bid on a lump sum basis with quantities available on only five items. For these unit prices have been calculated as shown. These are included in the summary of lump sum bids which are shown here as percentages of total cost. Bidders include:

1C Barnes Const. Co., Inc., General Contractors, Grand Rapids, Mich.	$177,515
2 C. L. Dietrich Co., Inc., Detroit, Mich. & Frank M. Johnson Co., Inc., Dearborn, Mich.	179,955
8 United Piping & Erecting Co., Lansing, Mich.	210,589
EE Francis Eng. Co., Saginaw, Mich.	177,965

Bids: 2-11-54 Item	Unit	Quantity	Unit Prices 1 C	2
Earthwork	cy	2,700	$1.56	$3.85
Concrete work	cy	707	52.54	68.89
Filter medium	cy	671	16.96	6.84
Sludge drying beds	sf	6,560	0.175	0.175
Additional Cl C conc	cy	10	10.00	50.00

This is how bidders distributed their lump sum bids:

	1 C	2
Total bid	$177,515	$179,955
% of total for	%	%
Miscellaneous & overhead	11.84	6.37
Earthwork	2.38	5.78
Concrete work	20.93	27.06
Pipe work, including sludge pump	12.81	12.17
Brick & stone work	2.29	3.17
Roofing & flashing	0.59	0.61
Miscellaneous metal work	3.40	3.33
Wood, metal doors, etc	1.26	0.77
Metal window sash, frames & screens	0.25	0.25
Carpentry work	0.47	1.31
Glass & glazing	0.10	0.07
Painting & finishing	1.63	0.86
Plumbing	2.61	3.26
Heating, incl external sludge heater	5.92	5.94
Screening mechanism	1.69	1.54
Furnish & lay filter bottom block	0.99	1.08
Furnish & place filter medium	6.41	2.55
Settling tank mechanism	3.05	3.15
Trickling filter distributor	2.17	2.78
2-450 gpm sew pumps, 1-150 gpm recirc pump	2.34	2.39
Digestion tank cover	4.76	4.00
Lab apparatus, chemicals & furniture	0.98	0.99
Chlorination equipment	3.00	2.94
Electrical work	2.33	1.67
Sludge drying beds	0.65	0.64
Roadways, walks, grading & fence	3.73	2.91
Sewage flow meter	3.73	2.13
Additional Class C concrete	0.06	0.28

Plant mix bid wins Alaska road job

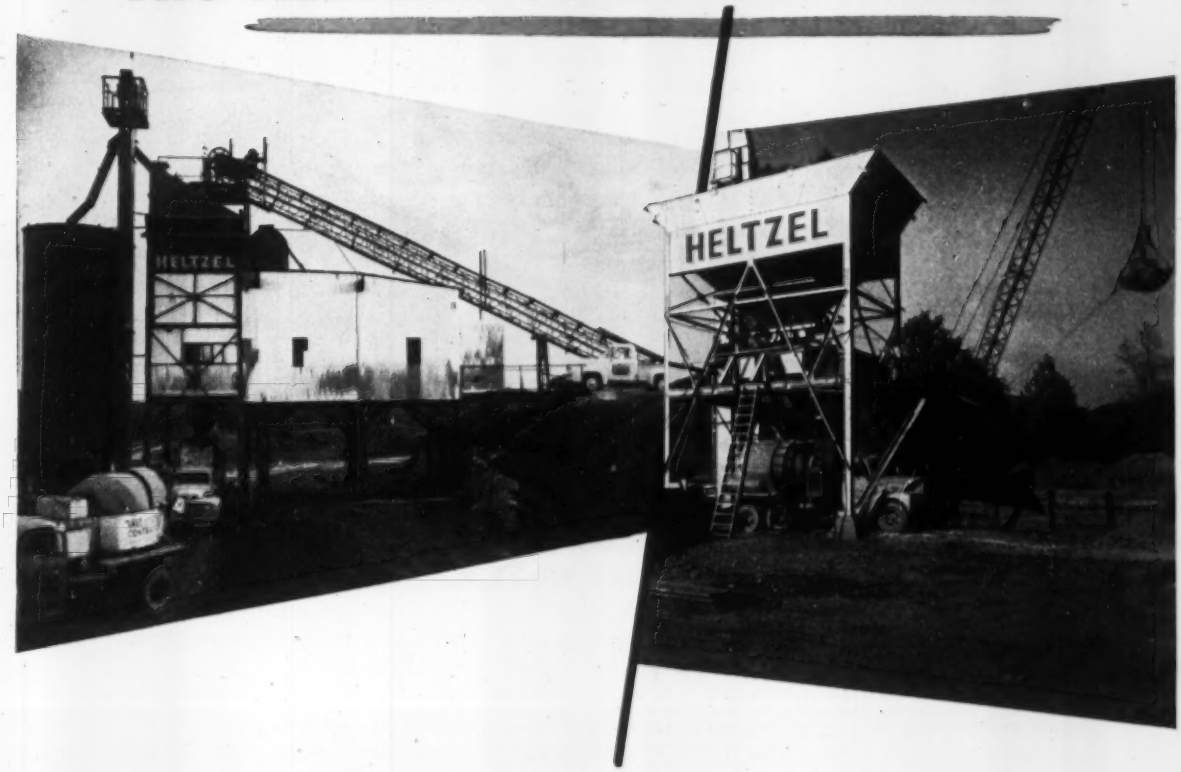
The Alaska Road Comm. awarded a $1,279,000 paving contract 2% under the engineer's estimate and 0.5% below the second bid. Crucial bidding was on bituminous hot plant mix, with Lytle-Green-Birch 6% and $26,000 under second bidder on this one item. Chief engineer is William J. Mimi.

The project to construct and repair 63.59 mi of Glenn Highway requires 534 calendar days, with only 100 working days annually and a great deal of rain. The work site is isolated—over 200 mi from Valdez port—and camp supplies will be expensive. Asphalt will be furnished at Valdez by the owner, who also furnishes gravel pit sites. Other materials will travel 1,000 mi from Seattle. Prevailing wage rates are: skilled $3.54 per hr, semi-skilled $3.34. Bidders include:

1C Lytle-Green-Birch, Des Moines, Iowa	$1,279,096
2 McLaughlin, Inc., Great Falls, Mont	1,285,820
6 Peter Kiewit Sons' Co., Seattle, Wash.	1,685,130
EE Wm. J. Mimi, Alaska Rd. Comm., Juneau	1,299,740

Bids: 3-16-54 Item	Unit	Quantity	Unit Prices 1 C	2
Misc force acct work	ls	1	$4,000	$4,000
Uncl exc	cy	6,000	0.80	1.50
Uncl exc for borrow	cy	10,000	0.60	1.00
Spec overhaul, borrow (1,000 ft free haul)	cymi	30,000	0.30	0.25
Fine gr, subr & shoul	mi	62.6	575	600
Watering	Mgal	12,600	2.00	2.00
Cr grav or cr stone base crse	ton	264,000	1.80	1.80
MC cutback asphalt, prime coat	ton	1,070	73.00	55.00
Cover aggr for seal	ton	8,100	7.65	8.00
RC cutback asph, seal	ton	910	56.00	50.00
Bit hot plant mix	ton	65,200	6.00	6.40
MC cutb asph, pavement	ton	96	26.00	30.00
RC cutb asph, pavement	ton	3,810	22.00	20.00
Dry plant mix aggr, stockpile	ton	3,000	1.25	1.00
Plant mix, stockpile	ton	600	4.00	5.00
Bit curb	lf	3,300	1.50	2.00
Rolling	hr	2,200	10.00	10.00
Meals	ea	9,000	1.50	1.50
Lodgings	ea	3,000	1.25	1.25

The HELTZEL TYPE-TWO PLANT



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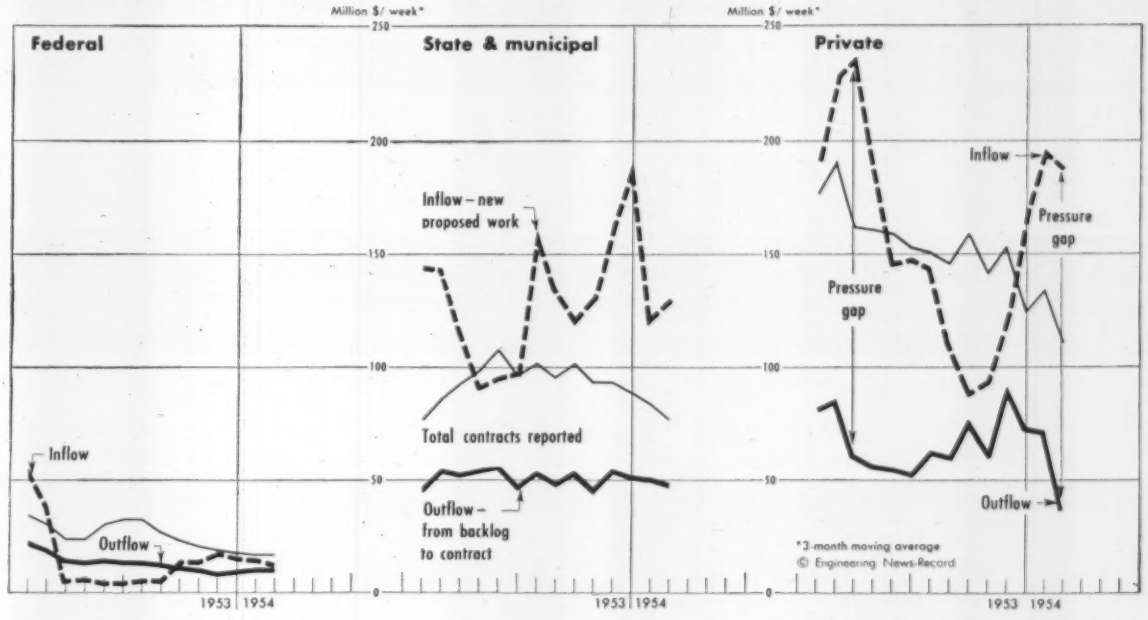
How the flow of proposed work into the backlog compares with the outflow to contracts



Heavy proposed work volume is good news for contractors

There is good reason to expect that the current upswing in private awards in state and municipal contracts will continue for at least another five or six months.

The reason is the heavy volume of new projects proposed during the five months since last October. There was a record total of $3.3 billion in proposed work during November and December. On top of that came another $4 billion in jobs proposed during the first quarter of this year. That means a total of $7.3 billion in prospective new construction business reported by ENR in five months. Nearly all of this is private and local-government work.

Of course, there's no telling how fast these proposed jobs will move out of the backlog into contract, but it would be reasonable to expect that a substantial amount will be awarded this year.

• **Private work: outlook bright**—As the chart shows (right-hand panel, above), private proposed work rose sharply during the fourth quarter of 1953 and stayed high during the first quarter of this year. In contrast, the outflow from the backlog to contracts has dropped off sharply in the last few months. Data are based on a three-month moving average, in order to eliminate sharp ups and downs.

This widening gap between the inflow of proposed work and the outflow to contracts is in a sense building up "pressure" within the backlog for work to move out at a faster rate. Look at what happened in 1953. During the opening months of that year there was a big increase in private work proposed, while at the same time the flow of work from backlog to contract was declining. The reason for the lag was, of course, the time necessary to complete plans and to arrange financing. Later in the year, work started coming out of the backlog into contract at a faster rate.

A similar trend is now on the way. Late in March, contract volume picked up sharply and is continuing at a high level so far in April. But this is not yet shown in ENR's moving average of work advancing out of backlog into contract.

• **State and municipal**—In this field there is usually a much longer lag between the time a job is proposed and the time a contract is awarded—often this is more than two years. This obscures the relationship between inflow and outflow of proposed state and municipal projects.

However, the chart (center panel) shows how the outflow of work into contract remained quite stable through 1953. The large volume of work proposed in the second half of 1953 should have the effect of increasing the flow into contract as 1954 goes on.

Toll roads and a couple of very large hydroelectric projects partly account for the two peaks in proposed work during the second half of 1953. According to ENR's survey of 1954 highway budgets (ENR Apr. 22, p. 21), some of the big road contracts already are scheduled for this year. Other projects may be able to let contracts by the last quarter. And of course it's possible that some of the hydro plant contracts might be awarded as 1954 goes on.

• **Federal picture is dark**—The current picture for federal construction contracts remains as dark today as a year ago, because of the Administration's drive to bring the budget into closer balance. The volume of proposed federal work (chart, left-hand panel) is a little higher than it was in the first part of 1953, but has been declining for the last few months. However, new authorizations could change this situation rapidly.

(*B & F continued on page 108*)

Bond market is overloaded, but condition won't last long

The municipal bond market, source of funds for state and local government construction, has a case of indigestion. Dealers have taken on more bonds lately than the investors will buy. But this condition won't last long, in the opinion of most Wall Street observers. And though interest costs to borrowers may rise slightly for a while, the added cost won't make much difference.

Apparently, this reasoning also has proved convincing to the New York State Thruway Authority, which decided last week to borrow from $300 million to $350 million in revenue bonds about June 1. The Authority decided to sell revenue bonds, even though it could still sell $250 million more of state-guaranteed bonds, which would take a much lower interest rate.

Here's what has caused indigestion in the bond market: The first quarter was the biggest in history for municipal bond issues, even though it was quite a bit below the record total of $1,671 million racked up in the last three months of 1953. Wall Street sources estimate that about $1,355 million in new bonds came to market in the first quarter. And ENR's more up-to-date scorecard of new bonds sold to finance public works (table) shows the same trend for the first 16 weeks of this year.

All this has pushed the total of unsold bonds on dealers' shelves to the highest level in history. Dealers have been cutting prices on bonds in order to move them out. And yields on new issues of municipals have been moving upward slightly during the last few weeks.

• **Nonchalant**—But most Wall Streeters aren't worried. Here is why:

As far as they can see now, the current business "readjustment" will continue through most of the rest of this year, at least. That means a decline in demand for funds by corporate borrowers. And yet at the same time, funds available for investment are piling up. For instance, deposits in mutual savings banks climbed $541 million during the first quarter, the biggest gain on record for any quarter. The March increase in deposits was also the largest ever for that month.

It's true that the latest McGraw-Hill survey shows that industry as a whole plans capital expenditures this year only 4% lower than in 1953. But most of this money will come from depreciation allowances and retained earnings, not from borrowing money or selling common stocks. In 1952, for instance, only about 22% of the funds industry used for capital spending were raised in the securities markets. If industry reduces capital spending by 4%, new corporate bond issues would show most of the effect of this cut.

• **Eager buyers**—Because of this expected decline in corporate issues, investors have been more receptive to municipal bonds. Furthermore, the attraction of municipals is increased by the fact that commercial banks are not loaning as great a volume of short-term funds to industry as they have in past years. That means banks have been big buyers of intermediate-term municipals this year—that is, bonds which mature within ten years. Wall Streeters who are optimistic about the municipal bond market expect this situation to continue.

• **The Federal Reserve**—Another reason that majority Wall Street opinion expects interest costs to stay low is the attitude of the Federal Reserve Board. FRB has been consistently throwing its weight on the side of easy money ever since last June.

Now there are rumors that FRB soon may lower the requirements for reserves which commercial banks in New York and Chicago must keep on deposit with their local Federal Reserve Bank. If this action comes, it would make more funds available to the banks in these two big money centers. Some of these extra funds would be invested in municipal bonds.

• **Turnpikes promising**—The situation is particularly promising where turnpike revenue issues are concerned, because these bonds are especially attractive to the same type of investors who buy corporate bonds. The investors: life insurance companies and pension funds, both huge buyers. Both types of investors can pretty well forecast for years ahead what they will have to pay out in death benefits and pensions. So they are able to tie up a large part of their assets in long-term securities.

Because these investors do not pay much income tax, turnpike authorities have to offer them interest rates which are comparable with those prevailing for corporate bonds. Since a decline in the supply of new corporate bond issues works to drive down interest rates on new corporate bonds, it also has an immediate effect on interest rates for turnpike issues.

• **No competition**—Furthermore, the U. S. Treasury does not seem likely to be competing with the turnpike authorities for long-term money—at least not on a very large scale. In order to encourage construction, the Administration's policy is to allow private borrowers to get this money. Treasury officials well remember what happened to the bond market a year ago last spring when the Treasury went into the market to borrow $1.6 billion in long-term funds at a time when private demand for long-term money was very high. The result was the famous "money pinch," which demoralized the bond market for weeks and had an

(Continued on page 110)

Highways, schools spark record state and local financing

Bond sales for financing new construction as reported by ENR

Type of work	First 16 weeks 1954	First 16 weeks 1953	% change '53-'54
All public works	**$1,571.5**	**$1,287.6**	**+22**
Heavy construction, total	**929.0**	**625.2**	**+49**
Waterworks	136.9	94.7	+45
Sewerage	108.2	187.3	−42
Bridges	14.2	109.1	−87
Highways	432.2	112.0	+286
Earthwork, waterways	49.7	8.1	+516
Unclassified*	187.8	114.0	+65
Buildings, total	**642.5**	**662.4**	**−3**
Schools	514.2	369.8	+39
Housing	42.6	178.5	−76
Other buildings	85.7	114.1	−25

*Includes publicly owned natural gas and power utilities; airports; parks; and general improvements.

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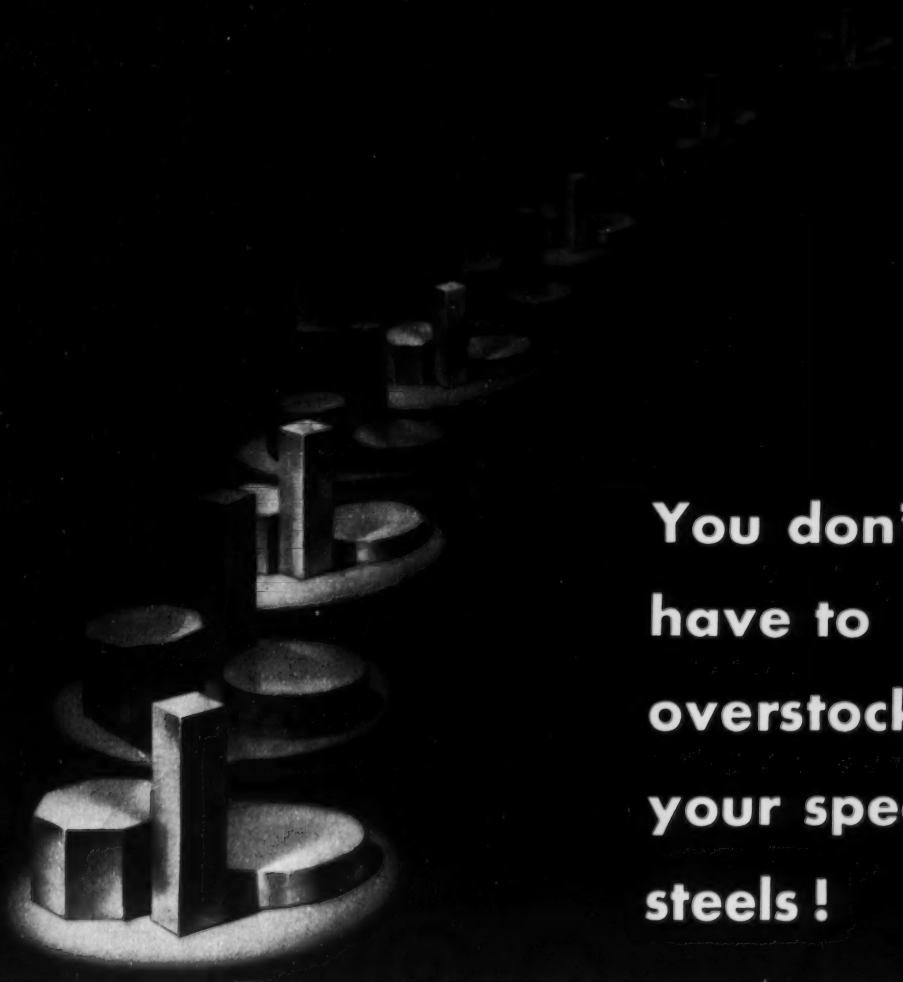

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even more serious effect on the mortgage market.

With this background in mind, the decision of the New York State Thruway Authority to borrow from $300 million to $350 million in revenue bonds about June 1 is not very surprising. Although the Authority still has the right to borrow another $250 million in bonds guaranteed by the state—which would be cheaper than to borrow by means of revenue bonds—it has apparently decided to hold this in reserve for a time when the market is not so favorable for revenue issues.

O'Brien predicts big gain for prefabricated homes

Makers of prefabricated homes will make and ship at least 75,000 units in 1954, a gain of 25% over last year. That's the prediction made this week by Gen. John J. O'Brien, president of U. S. Steel Homes, Inc., and newly elected head of the Prefabricated Home Manufacturers Institute. The general also went on to predict that by 1955, prefabs should account for 10% of new homes built in the U. S. They now account for 7% of single-family homes, he said.

O'Brien also offered some other statistics about the home prefab industry: He says that there are more than 60 well-established, steadily growing firms, and about 5,000 dealer-builders. The industry has produced over one-third of a million homes since World War II, about one out of every 25 nonfarm dwelling units built in the U. S. since 1946. More than a million Americans now live in prefab homes.

Big school building plans keep contractors hopping

Highways and toll roads aren't the only projects that are keeping construction rolling this year. Schools are another major category. This week, there was a good deal of news on school projects.

Here is a brief rundown:

In **California,** the state legislature approved a $100-million state bond issue for submission to the voters in November. This would provide additional aid for local districts. In the last few years, the state has provided about $500 million for local school aid. Also in California, the Oakland Unified School District has called an election for June 8 on scaled-down emergency bond proposals totaling almost $20 million.

Florida expects to borrow about $31 million about June 1 for school construction, part of a $120-million program which began last fall.

In **Indiana,** the INDIANAPOLIS STAR reports that 20 non-profit school districts have leased buildings from non-profit companies formed to build and lease schools, as a means of getting around the school debt limit of 2% of assessed valuation. About 200 other districts plan to use this method, according to the recent survey conducted by the newspaper.

In **New Jersey** the legislature was considering a $50-million bond proposal to provide funds which local school districts could borrow at reduced interest rates.

In **Pennsylvania,** plans for millions of dollars of new school buildings were held up pending clarification of the powers of local school building authorities.

In **Milwaukee, Wis.,** voters approved an $18-million bond issue as part of a five-year, $40-million construction program.

Big tax case on Sec. 608 involves 1,149 building firms

The current "scandal" over FHA loans guaranteed under Sec. 608 has an important tax angle. A test case now pending in U. S. Tax Court will affect hundreds of builders who received FHA-insured loans greater than the cost of their housing projects. T. Coleman Andrews, Commissioner of Internal Revenue, says that if he wins the case, builders may be liable for some $28 million in back taxes. Because of the Tax Court's crowded calendar, a decision is not expected to be handed down for about six months.

The test case involves a building corporation which put up a big rental housing project in fast-growing Queens County, part of New York City. The company got a loan for $24 million, but the project cost $20 million. Stockholders divided the $4-million windfall among themselves, claimed it as a capital gain instead at the 25% tax rate. The Internal Revenue Service contends the money should be treated as ordinary income, which could mean a tax rate as high as 75%.

This test case was started under the Truman Administration in October 1952. The Internal Revenue Service has announced that 1,149 building firms are involved.

Senator Harry F. Byrd has estimated that of 1,800 Sec. 608 projects which were examined by his Joint Committee on Reduction of Non-Essential Federal Expenditures, there are more than 700 in which FHA-guaranteed loans ran above the project cost.

Ports vs. tax bill

Fear development will be hurt by municipal-bond provision

A representative of several port agencies testified before the Senate Finance Committee this week that a section put into the omnibus tax revision bill by the House, in an effort to discourage use of tax-exempt revenue bonds by southern cities to attract manufacturers, would hurt port operations. But Senate staff counsel drafting the bill says the provision will be cleared up.

Thomas J. White, appearing as attorney for a number of West Coast port agencies, for the Port of New York Authority, and for the Airport Operators Council, testified that if Sec. 274 remains unchanged port construction will be curtailed. He said that Portland, Ore., has halted construction of a big grain elevator pending clarification of the bill.

The intent of Sec. 274 was to discourage use of revenue bonds by municipalities to finance plants for incoming industries. The section provides that rentals paid by manufacturers to local governments for such plants would no longer be deductible in the federal income tax.

• **Manufacturing?**—However, the port agencies believe that the term "manufacturing" may be held to apply to some of the activities carried on in publicly owned seaport and airport facilities which also are financed by revenue bonds. Courts have held that such activities as shelling and sorting peanuts and finishing and storing rough lumber are manufacturing processes. So concerns that normally use port facilities for operations like sorting, grading, storing, bagging or assembly would hesitate to enter into long-term leases because of the prospect of not being able to deduct the rental as a business expense.

Members of the drafting committee are now at work trying to eliminate bugs turned up in the tax bill since it was introduced. They say that they will attempt to straighten out Sec. 274 before the Senate acts on it, in order to prevent any discrimination against port operations.

What Sec. 274 seeks to do is keep local governments from, in effect, lending their credit to manufacturers. This gives manufacturers who rent such plants an advantage over those who do their own financing since tax-exempt municipal bonds carry a lower interest rate than private bond issues.

Business briefs . . .

• **Oil expansion**—The U. S. oil industry plans to spend a record $4.6 billion this year for expansion and development, according to the American Petroleum Institute. About $600 million of this would be spent abroad.

• **Bell System construction** will continue at a $1-billion-a-year clip, President Cleo F. Craig told American Telephone & Telegraph Co. stockholders at the annual meeting.

• **Commonwealth Edison Co.,** one of the biggest U. S. utilities, estimates it will spend $425 million for construction in the 1954-1957 period, increasing its total postwar construction spending to $1,150 million.

• **Other big spenders**—General Electric Co. has stepped up plant and equipment spending to $175 million this year, up 24% over last year's record. Du Pont Co. says its construction budget will be about the same as the $135 million it spent last year. J. C. Penny Co. says it has 95 new stores in the construction or planning stage.

• **Another material pipeline** is planned—This one to carry crushed limestone in suspension. Halliburton Portland Cement Co. expects to build a 120-mi gravity line from Clarkdale, Ariz., to its Phoenix plant. Pittsburgh Consolidation Coal Co. plans a 110-mi. pipeline, estimated to cost $10 million, from Cadiz, Ohio, to Cleveland.

• **F. H. McGraw & Co.'s** Canadian subsidiary, F. H. McGraw Co. of Canada, Ltd., will be replaced by a new firm, F. H. McGraw Co. of Canada (1954) Ltd. A controlling interest in the new corporation has been acquired by Power Corp. of Canada, Ltd., big utility holding company.

• **Piggy-back terminal** costing about $1 million will be started soon for New York Central System in Cleveland. This is a special terminal built to handle trailer-on-flat-car operations. Central is also studying sites in Chicago, Boston, Detroit, and North Bergan, N. J.

• **Webb & Knapp, Inc.,** fast-moving New York real estate and construction firm, says it is going to take it easy on any new big cash commitments for the time being. In 1953, the firm acquired three of the biggest office buildings in New York City. It has a $60-million building program, which it expects to finish this fall.

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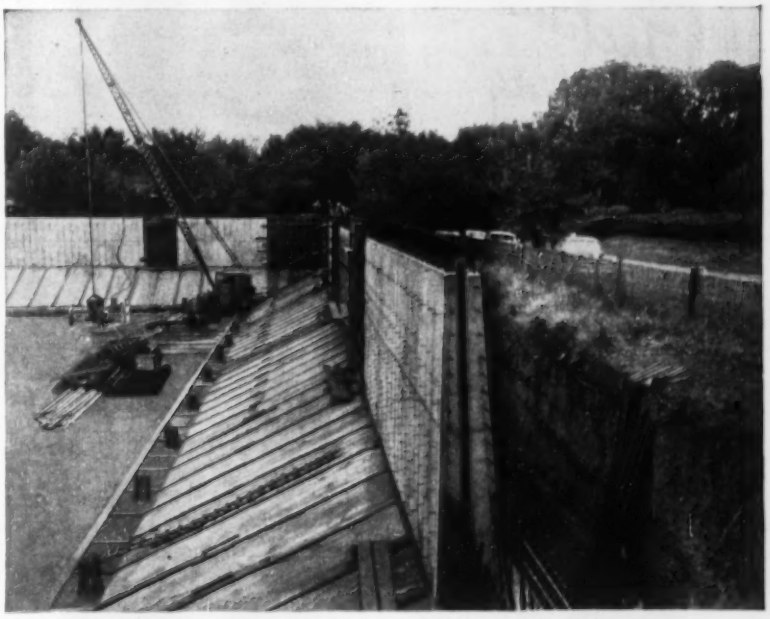

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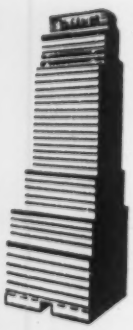

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McGraw-Hill Book Company, Inc.
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Activity This Week

As reported to ENR
(In millions of dollars)

Amount of contracts let

	This Week	Cumulative 17 wks 1954	1953	% chge
Federal	$20.2	$308.6	$518.8	−41
State and municipal	76.6	1,388.1	1,522.9	−9
Total pub.	96.8	1,696.7	2,041.7	−17
Total priv.	144.3	2,209.3	3,102.0	−29
U. S. total	**$241.1**	**$3,906.3**	**$5,143.7**	**−24**

Contracts by type of work

Waterworks	$2.7	$64.9	$84.3	−23
Sewerage	5.2	107.2	111.6	−4
Bridges	7.2	129.5	199.5	−35
Highways	38.6	482.0	447.4	+8
Earthwork, waterways	5.3	90.0	118.3	−24
Buildings:				
Public, excl. hsg.	17.2	521.8	554.9	−6
Housg., pub.	2.8	61.8	228.6	−73
Housg., priv.	76.9	1,228.1	1,359.3	−10
Commercial	24.4	382.5	319.6	+20
Industrial	34.8	520.2	1,186.4	−56
Unclassified	26.0	318.0	533.8	−40
Total	**$241.1**	**$3,906.0**	**$5,143.7**	**−24**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

(millions of dollars)	Week of Apr. 22 1954	Cumulative 16 Wks 1954	% chge 1953-54
Corporate securities	$94.8	$957.8	−28
State and municipal:			
Excluding housing	134.5	1,528.9	38
Housing	...	42.6	−76
Federal loans	1.6	41.8	−11
Federal aid	...	...	...
Total non-federal	**$230.9**	**$2,571.1**	**−3**
Federal approps.:			
In U. S.	...	...	...
Outside U. S.	...	...	...
Total new capital	**$230.9**	**$2,571.1**	**−3**

ENR indexes		Base years = 100 1913	1926	1949
Constr. cost	Apr '54	615.36	295.80	129.00
	Mar '54	613.99	295.14	128.71
Bldg. cost	Apr '54	437.94	236.74	124.49
	Mar '54	437.17	236.32	124.27
Volume	Mar '54	426	173	123
	Feb '54	345	140	100

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $1.80 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record 330 West 42nd Street New York 36, N. Y.

Bids: May 6, 1954

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 6th. day of May 1954, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 2, L. KETCHUM, District Engineer, 109 No. Genesee Street, Utica, N. Y.						
Oneida	FARC 54-40	Oneida-Verona, S.H. 5558 Proj. F-156(3) Cont. No. 1	1.96	9" Cem. Conc. Pavt. 25' Wide = 1.94 Mi. Misc. Work = 0.02 Mi.	$24,000 Plans $15	$427,000
Montgomery	RC(MT)54-60	Fultonville Village-Fonda Village S.H. 864 Fultonville-Amsterdam Pt. 1, S.H. 5656 (Relocated for N. Y. State Thwy.—Mohawk Sect.-sub. 14)	1.43	Asph. Conc. Opt.= 1.41 Mi. Misc. Work = 0.02 Mi.	$17,000 Plans $10	298,000
DISTRICT No. 3, WILLIAM ROBINSON, Weigh Lock Building, Syracuse, N. Y.						
Cayuga	R.C. 54-61	Seventeen Various Highways	....	Removal of 76 Trees	$400 No Plans	7,000
Onondaga	FAC 54-3 FASH 54-3 FASS 54-5 FARC 54-43	Syracuse: Park Street to North City Line Syracuse-Mattydale Luther Avenue Access Road and County Road 208 Connection Syracuse-Cicero, S.H. 5470 and Acc. Rds. Mattydale Interch. Proj. UI-463(9)	4.38	9" Cem. Conc. Pavt. Var. Wide = 3.69 Mi. Asph. Conc. Opt. = 0.48 Mi. Bit. Application and Stone Cover = 0.21 Mi.	$100,000 Plans $15	1,793,000
Seneca	O.T.54-1	New York State Thruway-Ontario Sect. Sub. 1-Restaurant and Gas Station Site (Junius Ponds)	....	Grading, Paving & Misc. Work	$10,000 Plans $10	176,000
DISTRICT No. 5, C. R. WATERS, District Engineer, 65 Court Street, Buffalo, N. Y.						
Erie	FASS 54-8	Four Rod Road C. R. 344 Proj. S-296(1)	0.31	Asph. Conc. Opt. = 0.29 Mi. Misc. Work = 0.02 Mi. I-Beam BR. 104.5'	$8,000 Plans $10	150,000
DISTRICT No. 8, J. S. BIXBY, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Orange and Rockland	P.I.P. 54-2	Palisades Interstate Parkway (Rte. 45-Bear Mt. Circle)	13.87	Roadside Improvement	$16,000 Plans $50	300,000
Orange	FASH 54-9 FARC 54-62	Palisades Interstate Park-Goshen Pt. 1B & 2 Oxford, Town Road and Co. Rd. 13 Oxford-Chester S.H. 5297 and Oxford-Chester S.H. 8076 Proj. FI-IG-1050(7) Cont. 2 FI-IG-1050(6)	4.47 (Acc. 0.39)	9" Cem. Conc. Pavt. 2 @ 25' Wide = 3.44 Mi. Cem. Conc. Pavt. on Access Rd. = 0.35 Mi. Asp. Conc. Opt. = 1.01 Mi. Misc. Work = 0.02 Mi. 3 Hy. Sepa. Comp. I-Beams 282', 287.1' & 180.5' 2 RR Sep. Comp. I-Beams 199' and 224' 1 Br. R. C. Twin Box 67.3'	$300,000 Plans $100	5,400,000
Rockland	R.C. 54-63	Various Highways	....	Removal of 250 Trees	$1,000 Plans $10	17,000
DISTRICT No. 10, M. E. GOUL, District Engineer, Montauk Highway, Babylon, L. I., N. Y.						
Bronx	FAMDE 54-2	Major Deegan Expressway Extension Cont. 8A Proj. U-1082(20)	0.55	Sheet Asp. Pavt. = 0.43 Mi. Misc. Work = 0.12 Mi. Alterations to IRT Elev. RR Alterations to Van Cortland Park Utilities	$40,000 Plans $25	700,000
Suffolk	FARC 54-29	Mattituck-Greensport Pts. 1&3 S.H. 8229 Proj. F-348(5)	1.75	Asph. Conc. Opt.	$14,000 Plans $10	258,000
Suffolk	SMSP 54-1	Sunken Meadow Spur Parkway Cont. 2	7.44	Grading & Drainage	$75,000 Plans $50	1,453,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

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OFFICIAL PROPOSALS

Bids: May 11, 1954

New Jersey Turnpike Authority

CONTRACT NO. GR-4

Sealed proposals are invited for Contract No. GR-4 which involves furnishing and erecting new traffic signs, relocating existing signs, and other incidental work, at various Service Areas along the New Jersey Turnpike.

Principal items of work include:

Traffic Signs, Wood, Reflectorized	22
Traffic Signs, Metal, Reflectorized	167
Traffic Signs, Metal, Non-Reflectorized	56
Traffic Signs, Wood, Non-Reflectorized	15
Traffic Signs, Relocation	20

Proposals will be received at the office of the New Jersey Turnpike Authority, Administration Building, New Brunswick, New Jersey, until 11:00 O'Clock, Eastern Daylight Saving Time, on the morning of May 11, 1954, at which time and place said proposals will be publicly opened and read.

The receipt and opening of proposals are subject to proper prequalification of the bidder in accordance with the regulations adopted by the New Jersey Turnpike Authority. Bidders must also submit with their proposal a revised financial statement and a statement of plant and equipment.

Contract documents may be examined during office hours after April 22, 1954, at the office of the Authority and at the office of the Consulting Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, New York. Contract documents will be furnished upon deposit of Fifteen Dollars ($15.00) for each set, upon application to the Authority. The deposit will be refunded if the contract documents are returned in good condition to the Authority within fifteen (15) days after the receipt of proposals.

NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast, Chairman

April 22, 1954

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4159) will be received at Rock Springs, Wyoming, until 10 a.m., May 25, 1954, for furnishing labor and materials for earthwork and structures, Eden Canal, Station 665 40.37 to Station 891 62.30 and Laterals E-7, E-8, and E-9, Eden Project, Wyoming. Location near Farson, Wyoming. Principal items are: 198,000 cu. yds. excavation; 385 cu. yds. concrete; 51,700 cu. yds. placing and compacting earth lining; furnishing and laying 18-inch to 36-inch-diameter concrete culvert pipe, and other work. Completion time 400 days. For particulars, address Bureau of Reclamation, Rock Springs, Wyoming; or Building 53, Denver Federal Center, Denver, Colorado. W. A. Dexheimer, Commissioner.

Bureau of Reclamation, North Platte River District—41254-P7, Casper, Wyoming. UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION. NOTICE IS HEREBY GIVEN that sealed bids on Invitation No. 703S-323 for furnishing and delivering structural steel for Additions to Gering Substation, Transmission Division, Nebraska, Missouri River Basin Project, will be mailed to P. O. Box 280, Casper, Wyoming or delivered to the office of the Bureau of Reclamation in time for the public opening at 2:00 p.m., Mountain Standard Time, May 6, 1954, at the office of the Bureau of Reclamation, Reclamation Center, Casper, Wyoming. Copies of the standard forms and of the invitations may be obtained from the following offices of the Bureau of Reclamation: R. J. Walter, Jr., Regional Director, Building No. 46, Denver Federal Center, Denver, Colorado; and I. J. Matthews, District Manager, P. O. Box 280, Casper, Wyoming. No charge for copies of the invitations furnished for bidding purposes; for all others $0.75 per copy, not returnable. Payments should be made by check or money order payable to the Treasurer of the United States. I. J. Matthews, District Manager.

OFFICIAL PROPOSALS

Bids: May 7, 1954

Construction of Trunk Sewer

SEALED PROPOSALS will be received at the office of the DIRECTOR OF PUBLIC SERVICE, AKRON, OHIO, until 12:00 o'clock noon (Eastern Standard Time) or 1:00 o'clock (Daylight Savings Time) on the 7th day of May, 1954, for the construction of the:

CAMP BROOK SANITARY TRUNK SEWER

in Camp Brook Valley from the Baltimore and Ohio Railroad easterly to the East Corporation Line of The City of Akron.

Drawings, specifications, and blank proposals can be obtained at the office of the Engineer of the Division of Sewerage, by making a deposit of Five Dollars ($5.00). This deposit will be refunded if a proposal is submitted and the drawings are returned in good condition, within five days after the date the proposals are received.

Each proposal must contain the full name of the party or parties making the same, and all persons interested therein, and must be accompanied by a certified check in the sum of Five (5) per cent of the total bid on a solvent bank, as a guarantee that if the proposal be accepted, a contract will be entered into.

Bidders must use City of Akron printed proposal form, as none other will be accepted.

The City of Akron, Ohio, through its duly authorized and constituted officials, reserves the right to reject any or all proposals and to waive informality in any proposal.

THE CITY OF AKRON, OHIO
By: LEO G. WALTER
Director of Public Service

Bids: June 1, 1954

Southfield Outlet Sewer

SOUTHFIELD OUTLET SEWER
DEPARTMENT OF PUBLIC WORKS
CITY OF DETROIT, MICHIGAN
CONTRACT PW-256

Sealed proposals for a sewer, located in Ford Road, near Southfield Road in the City of Dearborn, addressed to the CITY ENGINEER'S OFFICE, DEPARTMENT OF PUBLIC WORKS, of the City of Detroit, and endorsed: "Proposal for Contract PW-256" will be received at the OFFICE OF THE CITY ENGINEER, 30TH FLOOR, GUARDIAN BUILDING, DETROIT 26, MICHIGAN, until 2:00 P.M., City of Detroit Time, on JUNE 1, 1954, at which time they will be publicly opened and read aloud. Any proposal received after the above-mentioned time will be returned to the bidder unopened.

The work included consists of approximately 2880 lineal feet of 10'-0" inside diameter sewer to be constructed in tunnel under Ford Road between Southfield Road and a point approximately one-half mile east of Southfield Road. The location of the work is in the City of Dearborn. Connections to existing sewers are to be made at both ends of the new sewer.

The Contract Documents, including Notice to Bidders, Form of Proposal and Agreement, Drawings, and Specifications may be examined at the office of the City Engineer, and copies may be obtained by making a deposit of $20.00 per set, which sum will be refunded upon the return in good condition of the complete set of Contract Documents within ten days after receipt of proposals, or if used in submitting a bona fide proposal.

Each proposal shall be accompanied by a certified check or a satisfactory bidder's bond in an amount of not less than 5 percent of the total bid price, as security for the acceptance of the Contract.

All checks shall be made payable to the Treasurer, City of Detroit.

No bid after being submitted may be withdrawn for at least 45 days after the actual opening of bids.

The City of Detroit reserves the right to waive any informality in any bid, or to accept any bid, or to reject any or all bids, should it be deemed for its best interests so to do.

CITY OF DETROIT
CARL D. WARNER
Commissioner of Public Works
G. R. THOMPSON
City Engineer

OFFICIAL PROPOSALS

Bids: May 25, 1954

Construction of Turnpike Bridge

PENNSYLVANIA TURNPIKE COMMISSION
Harrisburg, Pennsylvania
NEW JERSEY TURNPIKE AUTHORITY
NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission and the New Jersey Turnpike Authority, acting in conjunction as specified in the Proposal Documents, until 10:00 a.m., Eastern Daylight Saving Time, May 25, 1954, for the following contracts in connection with the construction of the Delaware River Turnpike Bridge planned as a connection between the Pennsylvania and New Jersey Turnpikes:

Contract PN1—For the construction of two river piers to be located within the stream bed and two land piers, one on the Pennsylvania shore and one on the New Jersey shore. The principal items of work include:

Excavation	8,500 cubic yards
Steel Piles	76,000 lineal feet
Concrete	26,000 cubic yards
Reinforcing Steel	2,370,000 pounds
Granite Masonry	13,700 cubic feet

Contract PN2—For the construction of sixteen land piers and one abutment, all on the Pennsylvania side of the river. The principal items of work include:

Excavation	24,000 cubic yards
Concrete	15,600 cubic yards
Reinforcing Steel	2,774,000 pounds

Contract PN3—For the construction of ten land piers and one abutment, all on the New Jersey side of the river. The principal items of work include:

Excavation	17,300 cubic yards
Steel Piles	6,000 lineal feet
Concrete	13,400 cubic yards
Reinforcing Steel	2,310,000 pounds

Bidders also may submit Proposals for a combination of Contracts PN2 and PN3 or Contracts PN1, PN2, and PN3, which are designated in the Proposal Forms as Contract PN2-3 and Contract PN1-2-3 respectively. Combined quantities are as shown in the Proposal Forms.

All of the work is located in Bucks County, Pennsylvania, or Burlington County, New Jersey.

Proposals will be received at the Administration Building of the Pennsylvania Turnpike Commission, 11 North Fourth Street, Harrisburg, Pennsylvania, and immediately after the hour for closing be taken to the Public Utility Commission Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and immediately publicly opened and read aloud.

Proposal Documents may be examined during office hours after May 4, 1954, at the office of the Pennsylvania Turnpike Commission or at the office of the New Jersey Turnpike Authority, Administration Building, New Brunswick, New Jersey. Proposal Documents will be furnished upon payment of the following amount for each set.

Contract PN1	$20.00
Contract PN2	20.00
Contract PN3	20.00
Contract PN2-3	35.00
Contract PN1-2-3	50.00

No refund will be made.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance, Secretary-Treasurer
NEW JERSEY TURNPIKE AUTHORITY
April 29, 1954 Paul L. Troast, Chairman

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4162) will be received at Bismarck, North Dakota, until May 26, 1954, for furnishing labor and materials for garage and warehouse for Fargo Substation, Transmission Division, North Dakota, Missouri River Basin Project. Location near Fargo, North Dakota. Principal items are: 22,200 cu. yds. excavation; 20,500 cu. yds. compacting embankment; 230 cu. yds. concrete; lump sum, construction of 60- by 120-foot garage and warehouse with structural steel framing and insulated metal siding; and other work. Completion time 150 days. For particulars, address Bureau of Reclamation, Bismarck, North Dakota; or Building 53, Denver Federal Center, Denver, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: May 4, 1954

Construction of Water Testing Laboratory

KENSICO WATER TESTING LABORATORY CONTRACTS 394, 431 432 and 433

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 10:00 A.M., Eastern Standard Time, on TUESDAY, MAY 4, 1954, for each of Contracts 394, 431, 432 and 433 for the constructing and equipping of the Kensico water testing laboratory, located in the Town of Mount Pleasant, Westchester county, New York, all as set forth in the specifications, as follows:

CONTRACT 394, for the construction of the Kensico water testing laboratory, furnishing and installing certain equipment and furniture and furnishing electricity for temporary light and power for the work of constructing and equipping the laboratory. The laboratory will be about 128 feet long and 34 feet wide, consisting of a two-story central portion about 65 feet long, with basement, attic and pitched roof, and of two one-story wings with flat roofs. It will have a structural steel frame, exterior walls of brick with granite trim and interior walls or partitions of brick or hollow tile. The roof of the central portion will consist of pre-cast, nailable, concrete slabs covered with slate roofing, and the roofs of the wings will consist of reinforced concrete slabs, cast in place, and covered with built-up roofing coated with slag or gravel.

CONTRACT 431, for furnishing, delivering, installing and testing plumbing, water supply system and appurtenant equipment and for performing appurtenant work. The plumbing will consist of water, air, vacuum and gas distribution piping, plumbing fixtures and complete drainage systems for sanitary, chemical and other wastes; the water supply system will consist of two deep well pumps, a pressure tank, air compressor and an underground water main, and the appurtenant equipment will include an instantaneous hot water heater, compressors and vacuum pumps with tanks.

CONTRACT 432, for furnishing, delivering, installing and testing heating, ventilating and steam generating equipment. The heating system will be a low pressure system with two oil-fired steam boilers; the ventilating equipment will include a fresh air ventilating unit and four exhaust fans, and the steam generating equipment will have a high pressure, oil-fired steam boiler.

CONTRACT 433, for furnishing, delivering, installing and testing electric systems and equipment. The work will comprise electric light, power, fire detection, alarm and signal systems in the laboratory, an underground electric feeder to the Lower effluent chamber, a power system in that chamber and a temporary electric system for transmitting electricity for temporary light and power for the work of constructing and equipping the laboratory.

Pamphlets containing information for bidders, forms of bid and contract, specifications, requirements as to surety, etc., of each contract, can be obtained in Room 1316 at the above address. Reproductions of the contract drawings for Contract 394 are bound in each pamphlet for this contract and blueprints of the contract drawings for Contracts 431, 432 or 433 will be supplied with each pamphlet for the respective contracts. A deposit of $5.00 in cash or its equivalent will be required for each pamphlet including drawings and application may be made in person or by mail. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of $4.00 will be made for each other pamphlet with drawings returned in acceptable condition. For further particulars apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners, Board of Water Supply; BETTY COHEN, Acting Secretary.

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with the
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CONSTRUCTION—
Use the
Searchlight Section
ENGINEERING NEWS-RECORD

OFFICIAL PROPOSALS

Bids: May 6, 1954

Soil Explorations and Foundation Investigations

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A.M., Daylight Saving Time, on May 6, 1954 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON THE SPRAIN PARKWAY, BRONX RIVER PARKWAY, YONKERS TO JACKSON AVENUE, TOWN OF GREENBURGH, WESTCHESTER COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-67

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York
(b) Mr. J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, New York
(c) Mr. Charles Schaefer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's estimate of cost for this work is $52,230.00.

Proposal for this contract must be submitted in a separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $2,612.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

R. D. Tallamy
SUPERINTENDENT OF PUBLIC WORKS

Bids: May 14, 1954

Construction of Relief Sewer

SEALED PROPOSALS will be received at the office of the DIRECTOR OF PUBLIC SERVICE, AKRON, OHIO, until 12:00 o'clock noon (Eastern Standard Time) or 1:00 o'clock (Daylight Savings Time) on the 14th day of May, 1954, for the construction of the:

SWEITZER CREEK STORM RELIEF SEWER

from Diamond Drive to Cole Avenue.

Drawings, specifications and blank proposals can be obtained at the office of the Engineer of the Division of Sewerage by making a deposit of Five Dollars ($5.00). The deposit will be refunded if a proposal is submitted and the drawings are returned in a good condition, within five days after the date the proposals are received.

Each proposal must contain the full name of the party or parties making the same, and all persons interested therein, and must be accompanied by a certified check in the sum of Five (5) percent of the total bid on a solvent bank, as a guarantee that if the proposal be accepted, a contract will be entered into.

OFFICIAL PROPOSALS

Bidders must use City of Akron printed proposal form, as none other will be accepted.

The City of Akron, Ohio, through its duly authorized and constituted officials, reserves the right to reject any or all proposals and to waive informality in any proposal.

THE CITY OF AKRON, OHIO
By: LEO G. WALTER
Director of Public Service

Bids: May 11, 1954

Contract Nos. 40, 40A, 40B, 40C, and 40D

WEST VIRGINIA TURNPIKE COMMISSION
ADVERTISEMENT FOR PROPOSALS

Sealed proposals will be received by the West Virginia Turnpike Commission for:

The work to be done under these Contracts consists of the furnishing, erection and painting of two types of right-of-way fence, namely, Chain-Link Fence and Farm-Field Fence, and all other work incidental thereto. This work is located between Princeton, Mile 0, and Charleston, Mile 88, Mercer, Raleigh, Fayette and Kanawha Counties, West Virginia, and is in connection with the construction of the West Virginia Turnpike in the State of West Virginia.

The principal items of work include:

Contract	Approximate Quantities		
	4' Farm Fence	4' Chain-Link Fence	7' Chain-Link Fence
40	354,000 Lin. Ft.	34,800 Lin. Ft.	8,000 Lin. Ft.
40A	124,500 Lin. Ft.		
40B	124,500 Lin. Ft.		
40C	102,000 Lin. Ft.		
40D	10,000 Lin. Ft.	34,800 Lin. Ft.	8,000 Lin. Ft.

The Subdivisions of Contract 40 are as follows:

40A Princeton (Mile 0) to Ghent (Mile 20)
40B Ghent (Mile 20) to Maynor (Mile 42)
40C Maynor (Mile 42) to Standard Tunnel (Mile 68)
40D Standard Tunnel (Mile 69) to Charleston (Mile 88)

Proposals will be received at the office of the West Virginia Turnpike Commission, 1340 Wilson Street, Charleston 5, West Virginia until 1:00 P.M., Eastern Standard Time, and thereafter at the House of Delegates Chamber, State Capitol, Charleston, West Virginia until 2:00 P.M. Eastern Standard Time, on May 11, 1954, at which time and place said proposals will be publicly opened and read.

WEST VIRGINIA TURNPIKE COMMISSION
D. H. Morton
Chairman

Bids: May 25, 1954

Contract NYA-140.022

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
ADDITIONAL FLOODLIGHTING FOR PARKING AREA

Sealed proposals for the installation of additional floodlighting for parking area at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, May 25, 1954, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Contract Engineer of the Authority, Room 1112. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 5601, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Contract Engineer, who will furnish the documents.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of the documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, April 29, 1954

BRIDGE ENGINEERS
AND SPECIFICATION WRITERS

Civil Graduates of accredited U. S. colleges. Must have not less than the following experience:

Detailers—2 years structural steel or reinforced concrete detailing.

Designers—5 years responsible work on structural steel and concrete including work on long span bridges.

Squad Leaders—3 years responsible charge of squad on structural steel detailing.

Specification Writers—With design and field experience for writing specifications for steel bridges, concrete structures, and highway construction.

Please mail complete resume together with salary required to:

Howard, Needles, Tammen & Bergendoff
55 Liberty Street New York 5, N. Y.

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MANUFACTURERS REPRESENTATIVE

Strong, well-established company needs a manufacturers representative who calls on concrete block manufacturers and ready-mix concrete dealers. Liberal commission on fast moving necessary items with tremendous repeat potential. Excellent territories still available. For further details write:

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for Middle Essex County, N. J.
must be thoroughly familiar with site planning, storm and sewer design. Permanent organization.
Salary $10,000 for well qualified man

P-2379, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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experienced in design of highway bridges. Excellent opportunity for responsible men. Please write giving complete qualifications.

Berger Associates
404 South Clinton Street
Syracuse 2, New York

WANTED

Experienced engineers, highways-thruways, bridges, airfields, drainage, sanitation, soil mechanics (Field particularly), grade crossing elimination, concrete mixes, structural.

Draftsmen, designers, to Project Manager. Submit resume and telephone #

P-2516, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

MECHANICAL ENGINEER, graduate preferred. Must have practical experience in installing piping, equipment, plumbing and heating in sewage disposals, filter plants, power plants, industrial buildings, multiple housing, hospitals, schools, etc. Must be experienced in bidding and purchasing, and able to assume the overall management of this department. Employment will be with Mid-west firm on salary and profit sharing plan. All replies will be held confidential. Send resume of experience, education, personal details and reference with the first letter. Address P-2329, Engineering News-Record, 520 N. Michigan Ave., Chicago, Illinois.

WANTED: CIVIL Engineer with testing experience in soils, asphalt, and concrete to direct laboratory work and investigations. State schooling, experience and salary expected. Mid west. P-2478, Engineering News-Record.

POSITIONS VACANT

WANTED—CONCRETE Paving Superintendent large midwestern contractor operating nationally offers real opportunity for a qualified energetic cost conscious producer to join organization on project in midwest. Salary-incentive basis with eventual participation profit sharing and pension trust plans. P-2483, Engineering News-Record.

ELECTRICAL ENGINEER, graduate preferred. Must have practical experience in the overall electrical installations of sewage disposal plants, filter plants, power plants, industrial buildings, multiple housing, hospitals, schools, etc. Must be experienced in bidding and purchasing, and able to assume the overall management of this department. Employment will be with Mid-west firm on a salary and profit-sharing plan. All replies will be held confidential. Send resume of experience, education, personal details and reference with the first letter. Address P-2330, Engineering News-Record, 520 N. Michigan Ave., Chicago, Ill.

YOUNG CIVIL Engineer, interested in concrete. Send complete information to Scientific Concrete Service Corporation, 724 Salem Avenue, Elizabeth 3, New Jersey.

PLANT SUPERINTENDENT wanted for old established structural precast concrete Plant. Preferably with Engineering background. Please submit complete resume stating experience, salary required and date available to P-2395, Engineering News-Record.

POSITION AVAILABLE—Male opening for assistant managing director for contractors trade association upstate New York. Write — age and full data of experience and references. P-2351, Engineering News-Record.

FOREIGN POSITION open. General Sueprintendent of Grain Elevators: The Corporation de Defensa de Productos Agricolas, in instrumentality of the Republic of Colombia, S. A., will receive applications for early employment in this position, with headquarters in Bogota. Candidates must have at least 5 years practical experience in grain elevator operation with wheat, corn, rice or similar grains including working knowledge of drying, fumigating, cleaning, grading, etc. Knowledge of Spanish desirable. In replying give brief summary of education, age, family, experience, salary requirements, references, etc. Apply to Drying Plant Engineers, Inc., consultants for the Corporation, 1001 Connecticut Avenue N. W., Washington 6, D. C.

OHIO ENGINEERING firm desires to permanently employ engineers experienced in sanitary, industrial waste and industrial building engineering; also mechanical and electrical engineers. Reply giving full experience record, personal history and salary desired. P-2542, Engineering News-Record.

SUPERINTENDENT FOR Highway Improvement Contractor. Man required to be aggressive, able to read plans and lay out work, cost conscious and able to deal and associate with other contractors and engineers. Duties include supervision of laying sod but experience at this, not as essential as ability to push and produce. Guaranteed yearly salary unusually good as this is a large operation. Opportunity for advancement and profit sharing. Present contracts located in Maryland. Write to Highland Engineering Corporation, Box 43, Mt. Airy, Maryland.

PRINCIPAL ENGINEER to direct engineering staff of City Public Works Department in Westchester County, New York. Required: BS in C.E., Reg. P.E. (N.Y.) 8 years civil engineering experience. Send resume to P-2551, Engineering News-Record.

SELLING OPPORTUNITY OFFERED

WELL ESTABLISHED construction firm desires representative with a knowledge of the construction industry and preferably a command of the Spanish language and customs to represent them in foreign negotiations for work in the building, heavy construction and industrial fields. Will headquarter in the Southwest, but must be able to travel extensively. Give full details as to education, experience, salary expected and enclose references and recent photographs. RW-2421, Engineering News-Record.

EMPLOYMENT SERVICES

OVERSEAS PROJECTS Guide to most active constructors-engineers, oil co's., gov't & UN groups hiring for foreign projects. Send $1. Cove-McKane Int., GPO Box 126E, NY 1, NY.

SALARIED PERSONNEL, $3,000-$25,000. This confidential service, established 1929, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, 241 Orange St., New Haven, Conn.

POSITIONS WANTED

DRAFTSMAN WANTED—Experienced for detailing miscellaneous and/or structural steel by Bushnell Steel Company, P. O. Box 2579, Jacksonville, Florida. Reply giving brief resume of experience, education, availability, and salary expected. PW-2386, Engineering News-Record.

MECHANICAL SUPT., Mechanical inspector or master mechanic. Twenty-five years' experience with Erection, Repair, Maintenance of heavy industrial equipment in Power Plants, Pumping Stations, Industrial Buildings. Supervising Installation, Testing Air Conditioning, Freon Refrigeration, Steam Boilers, Steam Distribution, P.O.L. Systems, Heating, Plumbing, Diesel Engine Driven Generators. Available now. PW-2375, Engineering News-Record.

SUPT. CONCRETE paving 8 years exp. age 35 years also general Manager—Ready mixed concrete plant. PW-2469, Engineering News-Record.

GENERAL SUPERINTENDENT. Over 25 yrs. heavy construction experience. Qualified to take full responsibility of projects of any type or size. Good background, know men and equipment, available any location immediately. PW-2466, Engineering News-Record.

STRUCTURAL ENGINEER desires responsible position in New York metropolitan area. 25 years' experience in steel and reinforced concrete; 18 years in charge of medium-sized engineering organizations. PW-2443, Engineering News-Record.

CIVIL ENGINEER—Large experience in bridge design and construction, now chief bridge-administrative engineer for north-central state highway department with full responsibility for plans, contracts and supervision of field contruction including modern grade separation structures and large stream bridges. Expect to retire from present full time assignment July 1st, and will be available for consultant service (preferably guaranteed retainer for not less than 500 not more than 1000 hours annually) as advisor and to review completed bridge designs and contract specifications for state highway department or other constituted authority for important bridge projects. PW-2486, Engineering News-Record.

ESTIMATOR & CONSTRUCTION Engineer — thoroughly familiar with all phases of take-offs, pricing, sub bids, for commercial and industrial buildings, sewage treatment plants, refineries. PW-2418, Engineering News-Record.

CONSTRUCTION ENGINEER — C.S. graduate 25 years experience general and industrial chemical construction covering new contracts, office project management and field superintendence. Seek connection where top man required. PW-2333, Engineering News-Record.

MUDDY BOOTS—Not a white collar. BSCE, 32. 11 years of estimates, design, construction, investigations, surveys, and reports; usually all at the same time. Still have a lot to learn and probably want more money than I am worth, but offer conscientious hard work and loyalty in exchange. Foreign experience was in Far East; domestic experience in the Mid-West. PW-2556, Engineering News-Record.

STRUCTURAL ENGINEER, age 44, thoroughly experienced, steam and hydro-electric plants, heavy and light industrial plants, all refineries and commercial buildings. Chief of structural design last three years for West Coast corporation, supervised design of 100 million dollars worth of construction, domestic and foreign. Division being dissolved. Ability to organize and direct design and drafting. Available May 1st. PW-2534, Engineering News-Record.

CIVIL ENGINEER—Graduate Lehigh '49; 5 years experience in construction, layout, surveying, and deed & title search. Anxious to join surveying firm or contractor in need of young but aggressive engineer. PW-2544, Engineering News-Record.

CONSTRUCTION ENGINEER—B.S.C.E., 26, 5 years experience heavy construction, 3 years in responsible charge. Sewage plant, roads, airfields, large scale heavy industrial construction. Can aggressively organize, direct, construction. Presently employed top national construction organization. Wishes relocate, preferably with contractor, in responsible position. Top references. PW-2448, Engineering News-Record.

CANADIAN OFFICE Prof. Engineer newly arrived in U. S. seeks posit. with opp. anywhere Eastern States. Age 30. Exp. in organizing, Purchasing, sub-letting, negotiations, cost controls for all type size bldgs. Interviews appreciated. Gd. Ref. PW-2536, Engineering News-Record.

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POSITIONS WANTED

PROJECT MANAGER or Contractor's executive available. Broad experience heavy construction and buildings. Thorough organizer. Sound knowledge of field supervision, estimating, cost control, purchasing, subcontracts. New York preferred. PW-2557, Engineering News-Record.

CONSTRUCTION ENGINEER—C.E. Grad. Reg. Prof. Eng. 21 years experience, 13 of which as Supt. of Const. Knows estimating, job pushing, equipment, job organizing, administration. About 70% experience in heavy construction such as pile driving, docks, bridges. 30% in industrial construction. PW-2525, Engineering News-Record.

STEEL AND aluminum window manager desires position with established window manufacturer. Box PW-2500, Engineering News-Record.

PROJECT MANAGER, superintendent, twenty years heavy construction experience, power plants, industrial buildings, bridge and water front work, sewage disposal plants. Foreign or domestic. PW-2492, Engineering News-Record.

CONSTRUCTION ENGINEER, Reg. Electrical & Mechanical Engineer now in Europe completing contract as project engineer. Available June 15 for foreign employment. Wide experience mining, power plants, industrials, airbases. Location immaterial. Employer knows of this ad. PW-2493, Engineering News-Record.

ENERGETIC C. E.—Young, single, good school. Needs position with challenge, promise in construction, sales or promotion. Travel, relocate. Presently employed. PW-2489, Engineering News-Record.

TOWN ENGINEER position wanted by Civil Engineer. 11 years supervisory and design experience, P.E., M.C.E., age 31, married. PW-2490, Engineering News-Record.

SUPERINTENDENT OR Assistant Superintendent. 35 years in construction 20 years supervision. Mostly industrial construction. Good labor relations. References. PW-2554, Engineering News-Record.

GIANTS UNDER THE EARTH
The Construction of the Brooklyn-Battery Tunnel
This is the story of the key men of the miraculous 20th century—those hardy human sandhogs who dug under water and blasted through earth and rock to build the slick, modern tunnels we use today for fast motor and railroad traffic.
Illustrated and photos. Per copy..... $1.00
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WANTED
USED BACK-HOE ATTACHMENT FOR 2000B MANITOWOC SPEEDCRANE
CAYUGA FOUNDATION CORP.
30 Vesey St. New York 7, N. Y.

CONCRETE PLANT EQUIPMENT
2—1,200 barrel Johnson Cement Silos with bucket elevator, under track hopper and screw conveyor.
2—Johnson 150 cubic yard Concrete Plants, 3 aggregate and 1 cement compartment, 2 cubic yard aggregate and cement weight batchers, 520 barrel auxiliary cement bin with truck hopper, elevator and screw conveyor. One outfit has aggregate truck hopper and bucket elevator. Plants include 2 each of Ransome 28S Mixers.
50—1½ yard Blaw-Knox, R-46, Bottom Dump Concrete Buckets.
Subject to prior sale
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1—10" Diesel Portable Dredge
1—22" Steel Hull Diesel Dredge
1—16" Steel Hull Diesel Dredge
1—12" Steel Hull Diesel Dredge Portable
1—20" New Dredge Pump
1—20" 90° New Dredge Pump extra parts
1—Used Spud 44' long, 24" dia. 1¼" Steel Plate
1—5-Drum Dredge Hoist, 7500 S.L. Pull
1—3½ Cu. Yd. hard digging clam shell bucket, round nose
1—8 Cu. Yd. Dipper Steel Hull, Steam
1—Fairbanks-Morse Model 41C, 80 D.W. 250 Direct connected, Diesel Generator Set
H. P. GUION
303 West 42nd St. N. Y. C.
Tel. No. Circle 6-0919

WANTED
2 LOCOMOTIVE CRANES
30 to 40 ton capacity, 8-wheel type with standard 33" wheels and trucks, diesel engine of 100 h.p. or more, equipped with 50' to 60' boom, two main hoisting drums, prefer friction clutches on loading lines, prefer two traveling frictions forward and reverse, full circle cab swing, 13' maximum cab rear tailswing, 10,000 pound drawbar pull as minimum. Will consider boiler and steam engine type such as Ohio Model F and later types for conversion to diesel if practical.
Reply to A. W. Dainwood, Operating Manager
KIRBY LUMBER CORPORATION
Silsbee, Texas

GRADALL
Series 2400 with 6-cyl. Hercules gas. eng. mtd. on Diamond T 6x6 chassis complete w/36" bucket and 8' blade. Good condition. Attractively priced.
HEDGE & MATTHEIS COMPANY
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60 "	12" B P S	53#	60'
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A newcomer to the heavy construction industry that promises to hold its own in the highly competitive field of moving the most excavation at the lowest cost, boasts a top capacity of 27 cu yd. And with its teammate—Caterpillar's DW21 pneumatic tired tractor—it can highball this payload along at speeds up to 20 mph, says its manufacturer.

Best way to visualize the ruggedness and capabilities of this two-wheeled trailer—designated PR21 for "pneumatic, rear-dump"—is to take a look at how it's put together.

According to its manufacturer, the all-welded frameless hopper is designed primarily for rock-hauling—and it is built to take anything that rock can dish out. The body has a 14x10-ft top opening, to make it an easy target for shovels, draglines or other overhead loaders. It has an average height of 9½ ft off the ground in front and 6½ ft in the rear.

• **Shock proof bottom**—Side sheets of the hopper—which slope slightly to join the shock-resistance bottom—are of high strength ⅝-in. steel with box-type reinforcing. The sandwich-type bottom has a top layer of ¾-in. armor plate, an oak plank filler, and a ½-in. steel plate bottom. The oak filler is designed to act as a cushion for the top plate.

The draft and drawbar members are of reinforced 1-, ¾- and ⅝-in. steel, to withstand heavy stresses during high-speed hauling. Axle members of structural steel bolt into place. Wheels are equipped with tapered roller bearings and spring-loaded rawhide seals. Their wide-spread tread of 123-in. c-c of the 36-ply, 24:00x29 rock-grip tires furnishes unusual haul road stability. These big tires—also used on the DW21 tractor—give ample flotation and traction for operation in areas of poor footing.

• **Sharp turning**—The PR21 trailer and DW21 tractor make a team especially adapted for maneuvering in close quarters and for safe dumping over steep fills. One big asset of the unit is its ability to make sharp turns. The tractor-trailer unit can turn 90 deg in either direction. It has a minimum turning radius of 16 ft 9 in. with the body down, or 13 ft 5 in. with the body up.

(Continued on page 126)

Clark offers heavy-duty fork truck

The Clark-Ross Y-200 is a 20,000-lb (at 24-in. load center) machine designed for heavy-duty, on-the-job transfer of materials. The truck is hydraulically controlled throughout, including lift, tilt, power steering and power braking, and all main hydraulic units are in a separate compartment. Power is supplied by a Hercules industrial engine of 320 cu. in. displacement, rated at 112 hp at 2,800 rpm. Transmission for the front wheel drive, rear wheel steer unit provides four speeds forward and reverse. Clark Equipment Co., Battle Creek, Mich.

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The trailer brakes can be set independently to insure extra safety while dumping. Tractor brakes can be applied individually to "walk the rig" out of bog holes.

Unobstructed visibility of both the trailed unit and the road is provided from the deep-cushioned bucket seat. And operators of the DW21-PR21 team can work a full shift without the customary "2-o'clock fatigue" that cuts into production, the manufacturer claims.

• **Hydraulic dumping**—Another production booster is positive dumping ability. Power for dumping is supplied by a 55-gpm hydraulic pump mounted on the rear of the tractor. This power activates a pair of three-stage telescopic hoists. These powerful rams lift the body to a 60-deg angle for fast and clean gravity ejection of the load. A discharge lip extends far enough beyond the tires to throw materials far over the edge of fills, banks or stockpiles. A safety cable prevents tilting the body beyond safe limits.

The trailer is 22 ft 2½ in. in length and 12 ft 10 in. wide. When teamed with the tractor the overall unit length is 33 ft 4 in. Normally, the complete unit has a wheelbase of 20 ft, but this is shortened to 13 ft 5 in. while dumping. Highest point on the rig, except when dumping, is 11 ft 4 in., while the lowest point clears the ground by 21 in. Loading height averages 9½ ft.

The PR21 trailer weighs 33,000 lb empty, and the DW21 tractor complete with fuel oils and other operating necessities weighs about 26,000 lb—making a total weight of 59,000 lb for the entire unit. When the unit is fully loaded, 48% of the weight is concentrated on the two big driving wheels and 52% on the trailer axle.

Selling price of the unit is about $18,000 making a total cost of about $40,000 for the DW21 tractor and PR21 trailer. ATHEY PRODUCTS CORP., 5631 WEST 65TH ST., CHICAGO, ILL.

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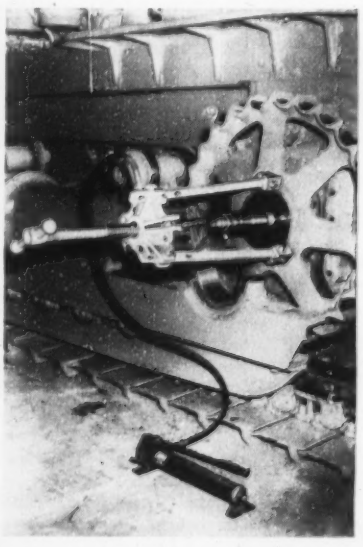

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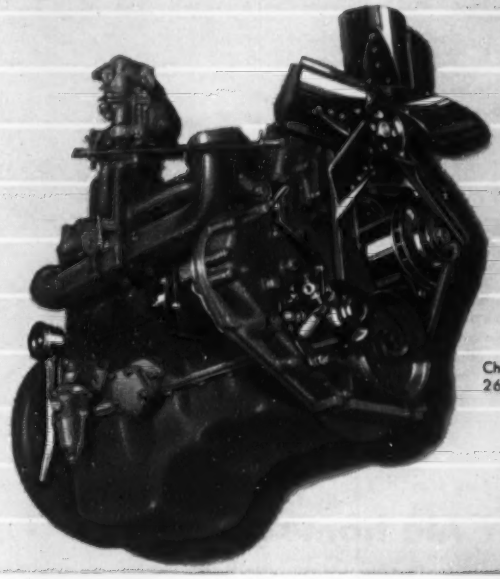
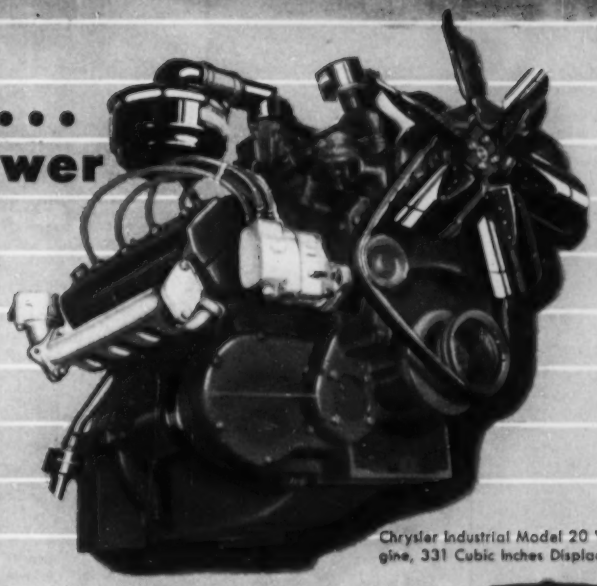
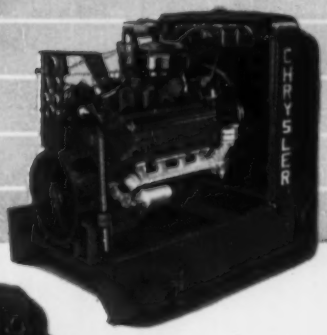


Chrysler Industrial Model 16 Engine, 265 Cubic Inches Displacement.



Chrysler Industrial Model 20 V-8 Engine, 331 Cubic Inches Displacement.

Chrysler Open Power Units include the complete engine, skid base, radiator and grille, instruments and instrument panel, flywheel and flywheel housing. (Pictured is V-8 Open Power Unit, which also includes a twenty-five gallon fuel tank.)



Chrysler Enclosed Power Units have the complete engine, instruments, instrument panel, skid base, fuel tank, radiator and grille, as well as fully enclosing sheet metal—side panels and hood top panel.

There are ten Chrysler Industrial Engines and Power Units, from 230 cubic inches to 413 cubic inches displacement. All of them operate with gasoline, natural gas or L-P gas fuels.

True to the Chrysler tradition, these engines, both L-head and V-8, are among the most advanced design, best engineered and most powerful engines available today in their power ranges. Yet, thanks to famed Chrysler Research, they are constructed of lightweight, highly alloyed steels and allow amazing horsepower to weight ratios.

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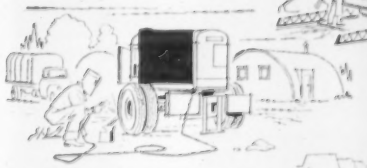
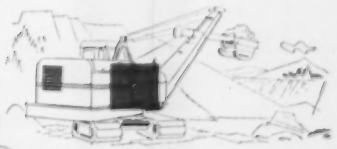
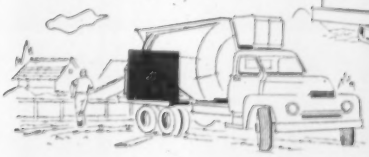


Portable Arc Welder—powered with Chrysler Industrial Engine.



One-Half Yard Shovel—powered with Chrysler Industrial Engine.



Transit Cement Mixer—powered with Chrysler Industrial Engine.

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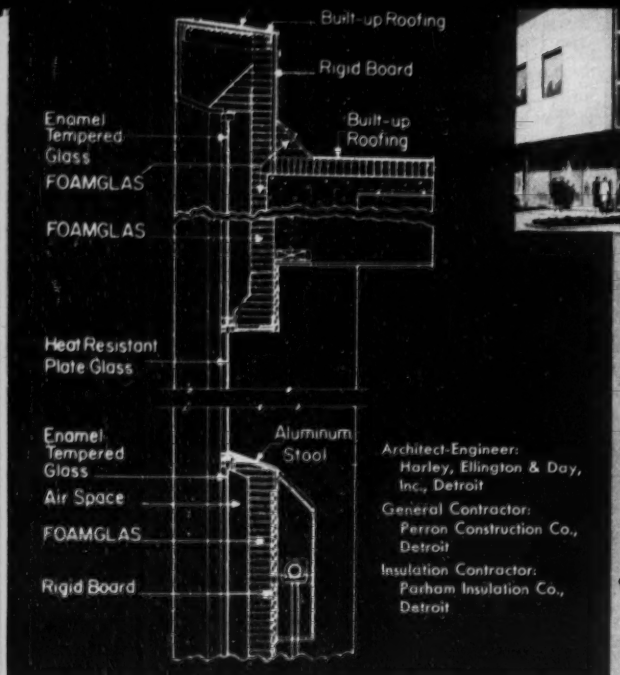


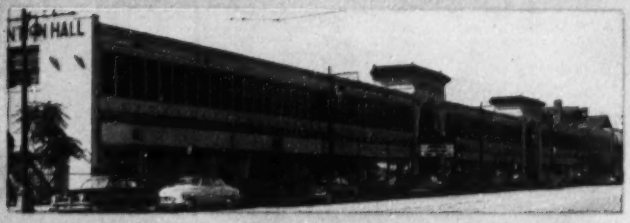
Architect-Engineer: Harley, Ellington & Day, Inc., Detroit

General Contractor: Perron Construction Co., Detroit

Insulation Contractor: Parham Insulation Co., Detroit

Above: New main office and bottling plant for Vernor's Ginger Ale.

Below: Detroit's old Convention Hall



Construction above and below vision strip on Woodward Avenue side of building consists of enameled glass outer face, air space vented for condensation drainage, FOAMGLAS adhered to transit and backed up with composition wall board. End wall construction is similar except that enameled porcelain is used in place of enameled glass for the outer face.

On new *Vernor's* Ginger Ale home...

FOAMGLAS provides long-life insulating performance

plus unique design advantages

Cellular, stay-dry FOAMGLAS was picked by Harley, Ellington and Day, Inc. to insulate the new home of Vernor's Ginger Ale, soon to be completed in Detroit. Created by remodeling Detroit's old Convention Hall, the new James Vernor Company Building will be comfort conditioned throughout. FOAMGLAS will help to insure efficient, inexpensive operation of both heating *and* cooling systems . . . and since the sealed glass cells of FOAMGLAS *stay dry* for lasting insulating efficiency, this saving in operating costs will continue to benefit Vernor—*year after year.*

Equally important are these bonus benefits which FOAMGLAS is providing on the Vernor job: First—because FOAMGLAS is easily shaped and fitted on the job site, it is ideally suited to the advanced type of wall construction being used (see detail above). Second—strong, rigid FOAMGLAS is used without direct structural support in some locations above and below the vision strip on the front facade. There it supports not only itself, but a rigid board backing as well.

Like Vernor, *your clients* will benefit from the outstanding insulating performance of FOAMGLAS while *you* will profit from its unique design advantages. For more information, see our catalogs in Sweet's . . . or send for our new booklets detailing the use of FOAMGLAS for walls, roofs, floors, ceilings, cold storage applications, piping or equipment. Write Dept. K-44.

Workman easily cuts FOAMGLAS blocks to fit between steel frame members of sub-structure.

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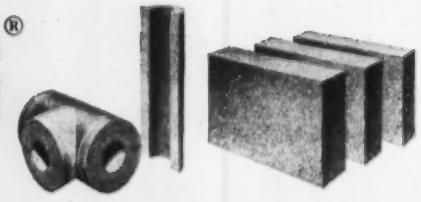


PITTSBURGH PC CORNING

Pittsburgh Corning also makes PC Glass Blocks

tors. Powered by a 50-ton hydraulic ram, the sprocket puller can be operated by one man in the field or shop.

Three types of pumps are available to operate the ram; a single speed hand pump, a three speed hand pump and an electrically driven pump. All operate at 10,000 psi.

The units are designed to work with OTC 50-ton Power-Twin hydraulic rams and may be purchased separately or complete with ram. OWATONNA TOOL CO., 370 CEDAR ST., OWATONNA, MINN.

New Products briefs . . .

• **Load binders**—A new device for pulling or binding down loads has been developed to replace such tools as the eccentric type of chain binder. Said to be more efficient and safer than the usual types, the new binder sells for $22.50 for the ¼-in. model and $29.25 for the ⅜-in. model. The units are manufactured by the Oildale Frosted Food Locker Co., 217 Roberts Lane, Bakersfield, Calif.

• **Masonry saw**—A new Di-Met masonry saw has been developed by the Felker Mfg. Co., Torrance, Calif., for use on all masonry materials. The new cut-off saw operates either wet or dry and uses either diamond abrasive blades or ordinary abrasive cut-off wheels. It is said to perform all types of operation such as step, through, skew, and angle cutting with ease and speed.

• **Pipe crimper**—A new hand pipe crimper has been designed to put crimps in the open end of any size sheet metal pipe up to 20 gage. Operation of the tool is reportedly simple—squeezing the handles together brings the 1¼-in. long forming jaw down on the open anvil jaw, forming the crimp as deep or log as desired. The tool—manufactured by the Witney Metal Tool Co., Rockford, Ill., measures only 9 in. long and weighs 1 lb.

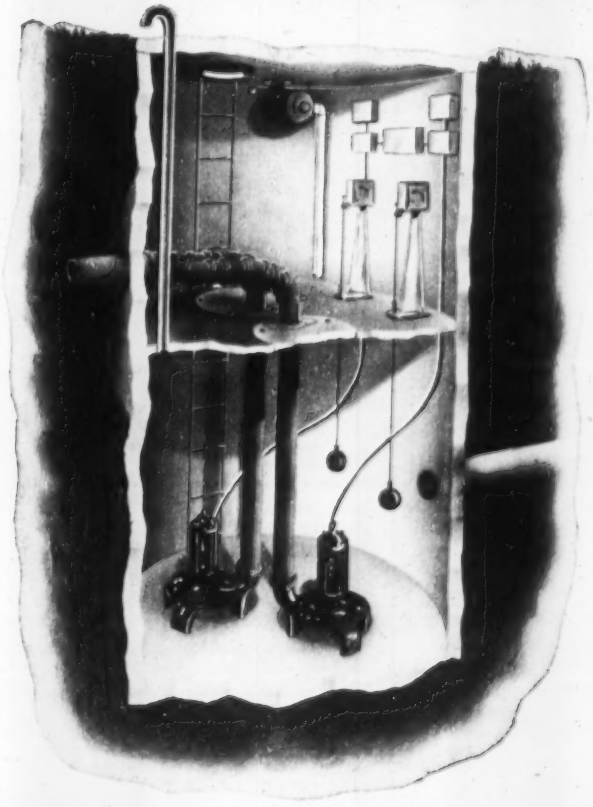
• **Super-power V-belts**—A new super-power V-belt is said by its manufacturer, Raybestos-Manhattan, Inc., Manhattan Rubber Div., Passaic, N. J., to have a horsepower capacity average of 40% over standard V-belts. The new belt's construction is of all synthetic rubber and incorporates a synthetic fiber strength member for greater power.

• **Scrapers**—Two new Terra Cobras have been added to the line manufactured by the Wooldridge Mfg. Co., Sunnyvale, Calif. Model TH-090B has a heaped capacity of 15 cu yd, and 12.2 cu yd struck. Horsepower on this model is 180. Model TH-090 has a heaped capacity of 13.5 cu yd and a struck capacity of 10.2 cu yd. Power is supplied by a 165-hp diesel. The new models are said to offer easy maintenance and simple operation plus a high degree of maneuverability.

• **Hydraulic hoists**—Two new arm-type hydraulic hoists for on or off highway truck application are now being produced by Gar Wood Industries, Inc., Wayne, Mich. The new models, 2825 and 2025, have 25- and 30-ton payload capacities, and feature 70-deg dump angles to assure quick clean-out.

• **Welder**—Newest addition to the welder line manufactured by the Hobart Bros. Co., Hobart Sq., Troy, Ohio, is a diesel engine driven arc welder of 300-amp capacity, especially designed for locations where electric power is not available. It is powered by a General Motors Model GM-2055 diesel engine rated at 67 hp at 1,500 rpm. One thousand combinations of voltage and ampere are available.

The SUBMERSIBLE SEWAGE EJECTOR



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Capacities 35 to 300 GPM with heads to 45 feet.
Discharge: 3" and 4"; ½ H.P. to 3 H.P. Motors.

Illustration shows economical installation which does not require a PUMP HOUSE to mar the landscape. This reduces the overall cost of the Lift Station.

Send for **NEW** *Bulletin*

NEW Bulletin SE 680 B with plans and specifications for lift station installations as well as other applications will be sent upon request.

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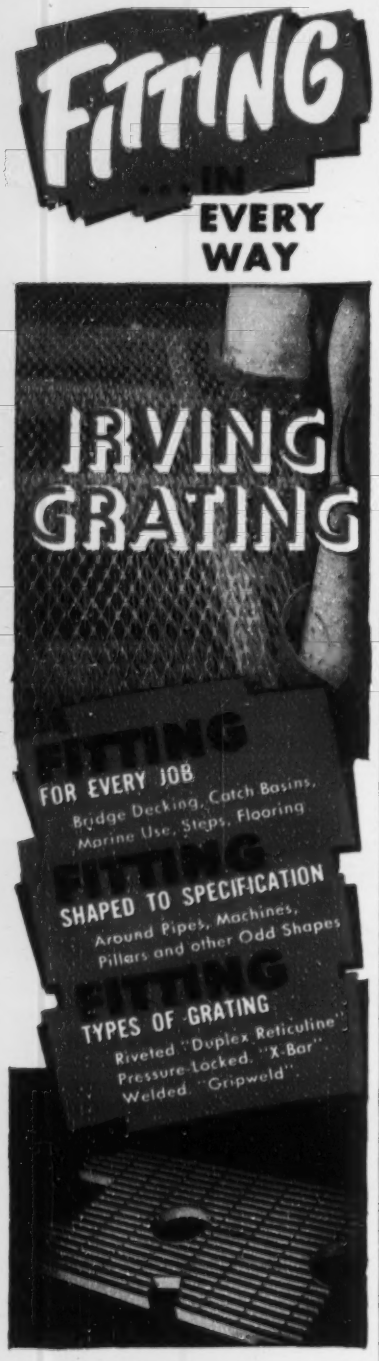
1528 NORTH FREMONT STREET • CHICAGO, ILLINOIS



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PUBLICATIONS

Venturi tube—This unit is a primary device used to produce pressure differentials from flowing liquids for the purpose of actuating rate-of-flow meters. The tube has a circular inlet and outlet but is constructed with an elliptical, in place of the customary circular, throat design. Data is given as to how any low-velocity, low-pressure flow of liquids, containing solids, can be measured in connection with a venturi meter. THE SIMPLEX VALVE & METER CO., 68TH & UPLAND STS., PHILADELPHIA 42, PA.

Sheepsfoot rollers—The advantages of a new type of cleaner teeth on giant Bros diamondfoot tamping rollers are explained in a new 4-page folder on these products. Schematic drawings and photos show how other design improvements qualify the sheepsfoot and diamondfoot tamping equipment for a wide variety of job specifications and conditions. ROAD MACHINERY DIV., WM. BROS. BOILER & MFG. CO., MINNEAPOLIS 14, MINN.

3D drafting—Three dimensional drafting is the main feature of a new publication. The first ten pages are devoted to a technical treatise on the subject of axonometric drawing; the remainder of the catalog is made up of illustrations of "Instrumaster" implements used in 3D drawing. Also included are a number of the most widely used templates and stencils for drafting. JOHN R. CASSELL CO., INC., 110 W. 42ND ST., NEW YORK 36, N. Y.

Movable metal walls—A new catalog contains information on flexible interiors for offices, factories, schools and buildings of every type. The 68-page book shows in detail how the Mills walls provide space control by keeping interior space efficient, always adaptable to changing space requirements. The catalog is divided into five sections. The first contains general information and three others are devoted to the basic types of Mills walls. Complete specifications for each standard type are included. THE MILLS CO., 976 WAYSIDE RD., CLEVELAND 10, OHIO.

Shovels and cranes—Descriptive bulletins are available covering the recently introduced Lima Type 44 and Lima Type 803 excavators. Type 44 is a 1-yd machine with a 15-ft dipper handle and a 20-ft boom. Equipped as a crane, it has a lifting capacity of 25 tons and is available on crawler or rubber-mounting. Type 803 is a

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2½-yd machine with an 18-ft dipper handle and a 24-ft 6-in. boom. Equipped as a crane it has a lifting capacity of 50 tons. Capacities, working ranges and brief specifications are included. BALDWIN-LIMA-HAMILTON CORP., CONSTRUCTION EQUIPMENT DIV., LIMA, OHIO.

Tennis courts—Laykold Tennis Courts is the title of a new 12-page, four-color booklet containing detailed specifications and color photographs of typical installations along with sections on cost, maintenance, resurfacing and player acceptance. The bituminous courts are said to offer resilient, grit-free, all-weather type surfaces. AMERICAN BITUMULS & ASPHALT CO., 200 BUSH ST., SAN FRANCISCO 4, CALIF.

Heating controls—Information on electronic controls of hot water heating systems is now available in Bulletin F 6167. With this system, turning a knob adjusts the ratio of change in outdoor temperature to change in water temperature. The catalog also contains information concerning the use of an optional night depression with morning warm-up feature.—BARBER-COLMAN CO., ROCKFORD, ILL.

Underground insulation—"Z"-Crete is the major topic of discussion in a new 8-page bulletin. The first section is used for a description of the material and its advantages. Typical installations using this light-weight resilient insulating concrete are shown as well as detailed job photos of re-insulation of existing conduits with the material. Specifications also are included. Z-CRETE DIV., ZONOLITE CO., 135 S. LASALLE ST., CHICAGO 3, ILL.

Service tool guide—A new service tool guide for all GMC gasoline and diesel-powered trucks is planned to help the truck service man to find the special service tool he requires to do the job in the shortest time with the least effort. The illustrated guide contains descriptions of tools and their applications that are recommended for every service operation. Special sections of the 52-page book cover: front axle, rear axle, cab and body, brakes, clutch, cooling, electrical features, gas and diesel engines, fuel systems, spring suspension, steering, mechanical transmission, hydramatic transmission, hubs and wheels and shop equipment. ADVERTISING DEPT., KENT-MOORE ORGANIZATION, INC., 5-105 GENERAL MOTORS BLDG., DETROIT 2, MICH.

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EDITORIALS

More, not less, civil defense

IT IS GRATIFYING to see a waning of the hopelessness that invaded the civil-defense situation after the H-bomb announcements were made. Officials who augmented this feeling by scare statements have taken a second look at the realities of that situation, and made amends. For the fact is that the fringe areas, where substantial construction and shelters will pay off, are immensely enlarged. It was never possible, even with block-buster bombs, to do much about the central target area.

The great widening of the fringe area brought about by the H-bomb gives added significance to the design rules proposed by Arsham Amerikian that were published on p. 21 of our April 15 issue. Also, it places new responsibility on architects and engineers in advising where these rules are to be applied.

Housing bill delay not harmful

PASSAGE of a new housing bill, which has been approved by the House of Representatives, is being held up by the Senate Banking Committee while it investigates the alleged scandals in the Federal Housing Administration. The delay may not be without blessings to the home-building industry if it results in the elimination of any faults in the new bill that encourage abuses or permit fraud.

Under the legislation that has been in force, both abuses and fraud have been charged on at least two types of FHA transactions, and it is these that will be probed. One of these relates to transactions under the regulation known as Section 608, which was enacted in 1942 to stimulate construction of privately owned rental housing by granting an insured mortgage of 90% of the cost of the facilities. The second type of transaction was an outgrowth of Title I of the Housing Act of 1950, passed to encourage loans for home improvement. In both cases, if FHA estimated the cost of the project high enough, builders could carry out the work—either build rental housing or make home repairs—and still have money left over that they could pocket as an undeserved profit.

Actually there can be no surprise that builders made large profits under Section 608 and Title I. For Congress voted these measures with the obvious purpose of offering incentives to builders to provide housing. The investigation, however, will seek to find out what profits were legal, what were made through violations of the spirit of the law and what were the fruits of collusion, negligence and bribery.

With these facts known, it should be easier to avoid similarly caused abuses in the future. Moreover, during the delay occasioned by the probe, the Senate will have the opportunity to reconsider the incentives to home-building in the new housing bill, to ascertain that these, too, will not result in excessive profits to unscrupulous individuals. For example, the question may well be asked: Will abuses appear under the provisions permitting lower down payments for new construction or under those easing the rehabilitation requirements for older homes?

While the investigation may not lead to many convictions, at least it may indicate how the housing bill could be changed to advantage. If so, both home buyers and legitimate homebuilders will profit by the resulting reduction in profiteering. Since incentives sufficient to sustain house construction at an annual rate of 1,000,000 units are still in existence, holding up the housing bill should do no harm.

The unknown in toll financing

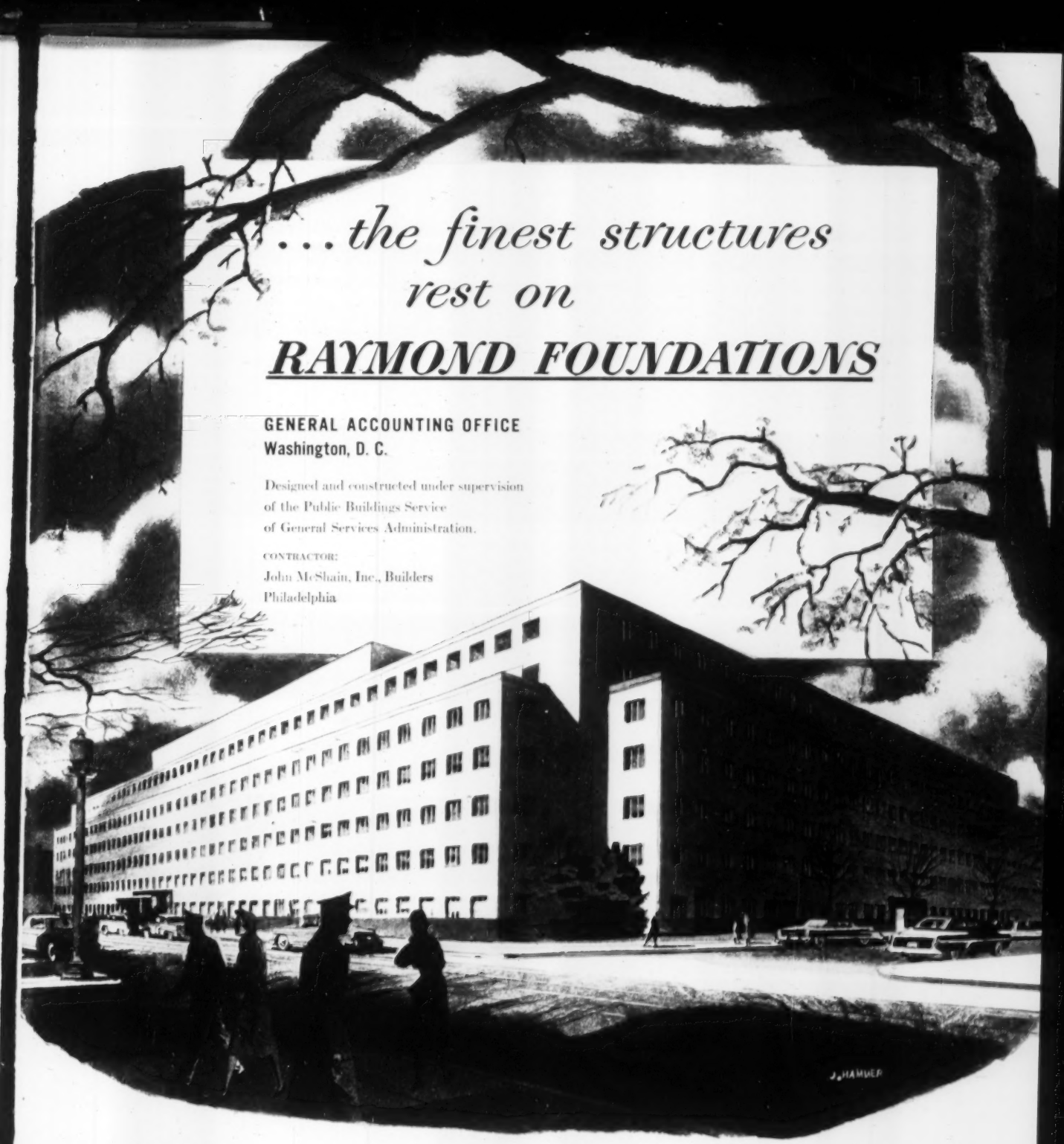
HOW MANY MILES of toll highways could be built as a sound investment in meeting the nation's expanding highway needs?

Any attempt to give a rational answer to that question is stopped short by the fact that we have no knowledge as to what is the top amount the public will pay per toll mile for the use of a better highway.

In a study of toll-road possibilities, made recently as background for one section of the President's economic message to Congress, the staffs of the Bureau of Public Roads and of the Undersecretary of Commerce for Transportation came up with a figure of 10,000 miles as potentially feasible for self-liquidating toll highways (ENR Feb. 4, p.21). But that study was based on an assumption that the tolls to be charged would be comparable with most of those now in force. Passenger car rates, for example, were figured at somewhat less than one and one-half cents per mile. Truck rates similarly were in line with those charged on most sections of existing toll highways.

There are, however, indications that the public will pay considerably higher rates in areas where congestion on other highways is bad. The best example of this can be found on northern sections of the New Jersey Turnpike where the passenger car rates for short sections run as high as four cents per mile. Many persons who commute by car in that area pay these higher toll rates twice daily to escape the disheartening congestion on the only other north-south routes through that area.

If that situation can be taken as a guide, it appears probable that relatively high tolls could be used to finance projects that did not look attractive when appraised in the past on the basis of the widely accepted rate of less than two cents a mile. This possibility may not add greatly to the mileage of potential toll highways. Yet it could pave the way for toll financing of badly needed new main arteries through densely populated areas where the development cost per mile is so high as to discourage attempts to finance the work out of normal highway income.



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"Twin" loads 16 bank yards in less than a minute..*with help of TIMKEN® bearings*

THIS big Euclid Twin-Power Scraper is working on a mountainous highway relocation job in North Carolina. Self-loading in a downhill cut, it consistently loads 16 bank yards in less than a minute!

One reason for this excellent performance: the "Twin" has 20 Timken® bearings in wheels and other key points. These bearings reduce friction, make the giant machine operate more smoothly and easily.

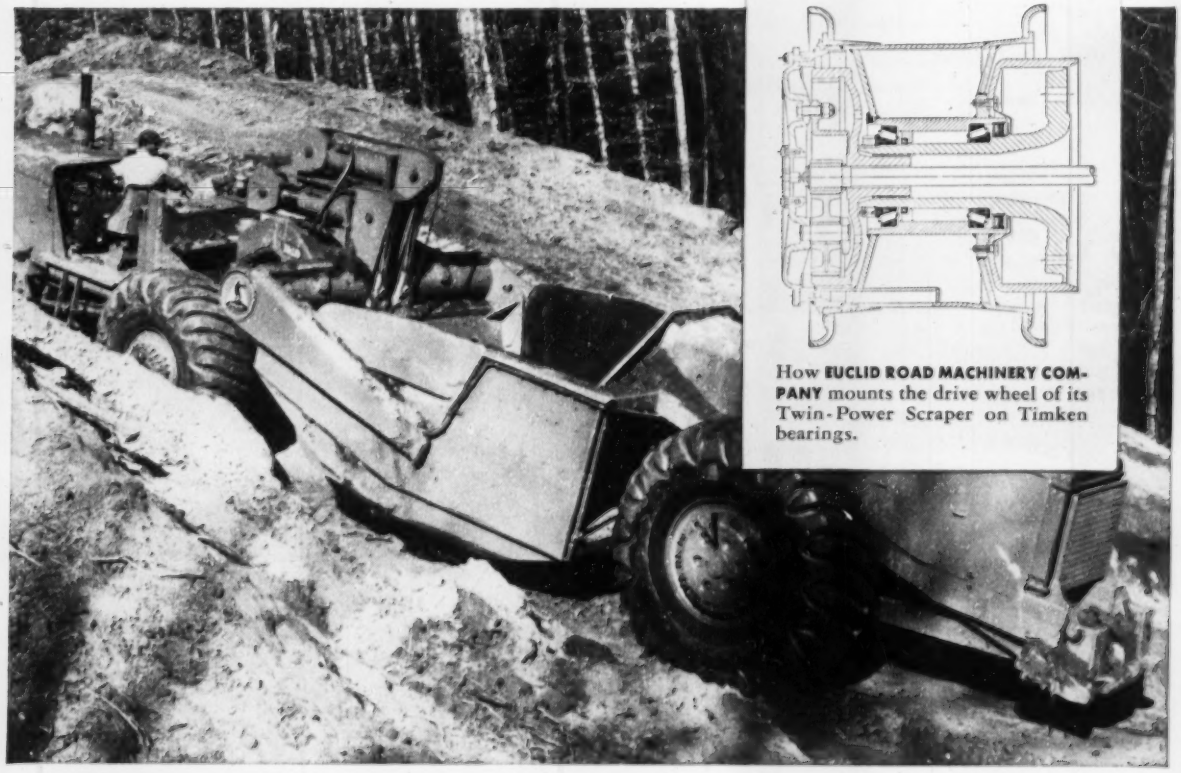
The diagram below shows how the wheels are mounted. With the "Twin" loaded, these wheel bearings take tremendous loads which makes Timken bearings ideal for the job. They carry the load on a full line contact between their rollers and races and this gives them inherently high capacity.

When the "Twin" rambles over uneven terrain, these wheel bearings must take heavy sidewise "thrust" loads in addition to the customary radial loads. That's another big advantage of Timken bearings: their tapered design enables them to take both radial and thrust loads in any combination so that no extra thrust devices are needed.

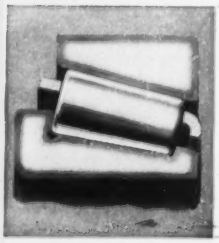
On tough applications like this, the superior quality of Timken bearings really pays off. For example, in order to get the best steel possible we make our own. No other bearing company in the U. S. A. does.

When you buy or build construction machinery, make sure the bearings are stamped with the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **EUCLID ROAD MACHINERY COMPANY** mounts the drive wheel of its Twin-Power Scraper on Timken bearings.



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Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis Timken steels.

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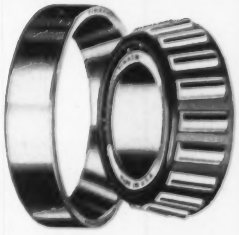

NOT JUST A BALL ◯ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ◫ AND THRUST ⬭ LOADS OR ANY COMBINATION ✳